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THE HISTORY OF THE SCHOOL.....

Academic Board,
Director, Student Officer, Assistant,
School of Aerial Photography, Housing
of the School, Physical Department,
Faculty.

HISTORY
OF THE

UNITED STATES ARMY

SCHOOL OF MILITARY AERONAUTICS /

AT

CORNELL UNIVERSITY

ITHACA, N. Y.

MAY 1917 to DECEMBER 1918

MEMORANDUM OF THE SCHOOL.....

MEMORANDUM OF THE SCHOOL.....

MEMORANDUM OF THE SCHOOL.....



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CONTENTS

ESTABLISHMENT.....	1
DEVELOPMENT OF THE SCHOOL.....	7
Academic Board, Curricula, Student Officer Engineers, School of Aerial Photography, Housing of the School, Physical Equipment, Quarters, Mess.....	
THE INSTRUCTION.....	117
Previous Experience of the Instructors, Status of the Instruct- ors, Vacations, Organization of the Staff, Methods of Instruction.....	
THE ADMINISTRATION.....	156
THE CADET CORPS.....	171
THE CADET PERSONNEL.....	175
Numbers of Cadets, Cadets Turned Back and Discharged, Discipline.....	
THE CLOSING OF THE SCHOOL.....	187
PHOTOGRAPHS OF THE SCHOOL.....	189
SAMPLES OF FORMS USED AT THE SCHOOL.....	213

FOURADLISHMERE

Aviation in Cornell University had its beginning early in March, 1917, when a body of seventy-five or one hundred undergraduates met and requested that a course in military aeronautics be given in the regular Reserve Officers' Training Corps of Cornell University in the same manner as Engineering and Signalling, which were taught to special companies. The President of the University asked the Adjutant General's Office to detail an officer here for the purpose, but was informed that there was at that time no provision for detailing an aviation officer to Land Grant Colleges.

Late in April, 1917, the President of the University received a communication from Professor W. F. Durand, Chairman of the National Advisory Committee for Aeronautics, asking if Cornell could undertake the instruction of about one hundred cadets in the fundamentals of aviation. An outline of instruction was forwarded shortly, and a committee consisting of Professors Bedell, Leland, and Ellenwood of Cornell University was sent to the Royal Flying Corps Ground School at Toronto, Canada, to investigate its methods, equipment, and curriculum.

This committee arranged a tentative curriculum and schedule of hours for a six week's course based on the

eight weeks' course at Toronto, and recommended men on the Cornell University staff to take charge of the teaching. President Salomon of Cornell University appointed Captain C. F. Thompson, U. S. A., Commandant of the Reserve Officers' Training Corps of Cornell University, to assist this committee.

In the meantime, Professor Hiram Bingham of Yale University, Major U. S. R., with the title of "Supervising Aeronautical Engineer," was put in charge of the Schools Division, A. S. S. C. He visited Toronto and stopped at Ithaca on his way back and consulted with the committee of Cornell men who had been there, and with the President. He left an official curriculum for an eight week course and asked the University to provide for housing and feeding the cadets, and to provide a suitable corps of instructors.

At that time no definite policy had been formed in regard to payment to the University. The cadets were to be given allowance for rations and a building with suitable heat, light, and janitor service was to be rented. The University was asked to make arrangements to mess all the cadets together. The Cornell University Athletic Association offered the use of its Schoelkopf Hall as a barracks and headquarters. The government was to provide cots, pillows, and mattresses.

The University was then notified that on Monday, May 21, 1917, the first class of twenty-five cadets would arrive. Captain Thompson proceeded to organize a teaching staff. In regard to the salaries of these instructors, President Sherman wrote Captain Thompson, "The War Department, however, finds it impossible to attend to these details at the present time. The University consequently will guarantee the salaries".

The cadets expected did not all arrive on the 21st of May, but for those who did report military instruction was started according to the curriculum. On May 28th, 1st Lt. Howard C. Davidson, A.S.S.C., arrived to take charge of the school.

The cadets were marched together to mess in one of the University Cafeterias. Buzzers for wireless practice were installed on tables in the basement of Schoelkopf Hall. The cadets received their laboratory instruction in engines in Rand Hall, their radio work in Rockefeller Hall, and other classes and lectures in rooms in Schoelkopf Hall, or in other University Buildings. A miniature range was being constructed in the baseball cage.

The teaching staff had been greatly added to by June 15. Sibley College furnished instructors in Engines under Professors Ellenwood and Pierce; Professor Blaker from Rockefeller Hall took charge of Theory of Flight,

Intelligence, and Radio Work; Professor Lawrence, of the College of Civil Engineering, took Map Reading and Reconnaissance; and the Artillery Cooperation and miniature airplane work was under C. H. James, Assistant A. R. C. As a rule the other men were recent graduates of Cornell who had had good military and academic records. Lieut. Davidson was the only commissioned officer on duty on June 15th, Captain Thompson having been ordered to Camp Syracuse. The Military instruction was under civilians who had been officers in the Cornell Aero Club.

The Schools' Division notified the Commandant shortly after the first class arrived that it was impossible to send twenty-five cadets per week, and appointed Lieut. Davidson and 1st. Lt. S. A. Mumford, M.R.C., a board to examine and admit men to training for flying officers.

Lt. Mumford, who had been Medical Advisor to the University, was ordered to active duty and took charge of the Medical work of the School. Captain Schultz arrived about June 1st, but requested transfer and left in a few days.

The first equipment consisted of a Curtiss OX motor, previously sent to Cornell University by the National Advisory Committee on Aeronautics for experimental purposes, various engine parts which were borrowed from the Thomas-Morse Aircraft Corporation and an old Colt machine gun owned by the Cornell M.C.A.C. About May 15th an old Curtiss Airplane (JH4B) was received. Other equip-

ment, including motors, maps, blank forms, old fuselage, etc., began to arrive shortly. The University furnished, on order from the University Treasurer's Office, buzzers, desks, chalk, materials for the miniature range, and other apparatus and supplies.

About June 1st, Major W. H. Davidson, Assistant President Shurman to/a "Committee on Studies" to arrange a schedule of hours and act in an advisory capacity to the Commandant in such matters as turning back and discharging cadets on account of poor academic work, and designing forms for reporting marks.

Professor W. H. Davidson was appointed chairman of this committee altho not otherwise connected with the School, and Professors Ellenwood, Blaker and Lawrence were members. On June 11th all except the chairman were teaching in the School. As will appear later this committee did not appreciate or understand that it was to have entire charge of the academic work of the school in order to relieve the Commanding Officer of the detail of it. At the time Captain Davidson (who had recently been promoted) was Commanding Officer, Acting Quartermaster, and lecturer, and he had no one to consult with as to paper work to help him except Sergeant Ross, who had had considerable service in the Regular Army and proved to be a very efficient man, but he too was ordered away, having been promoted to 2nd. Lieut. Consequently Captain Davidson

6

was swamped with paper work and unnecessary routine duties until he got an acting adjutant about August 1st, and the Academic Board took active control of its work about July 17.

On June 13th, Captain F. C. Page, Assistant Director of Schools of Military Aeronautics, who visited the Ground School at Cornell after visiting Toronto, wrote, "xxx
xxx After a period of three weeks work Cornell compares very favorably indeed with the Flying School at Toronto, and in some respects is well ahead of it."

THE DEVELOPMENT OF THE SCHOOL

On July 12, Major Hiram Bingham visited the Second School at Cornell. He severely criticized the Commandant and Chairman of the Committee on Studies for failing to send in reports of the proper kind and for not following exactly certain instructions in regard to schedule. The difficulty lay in the fact that it had not been made clear to President Schurman and to the Chairman of the Committee on Studies, Professor A. A. Conant, exactly what the duties of the latter were to be, and consequently the Commandant had been carrying his own work and the academic work at the same time. Major Bingham also said that the teaching staff was not large enough and especially criticized the instruction in the Military Department. The work of the Committee on Studies, to be called thereafter, the "Academic Board", he outlined verbally as follows, thereby relieving the Commandant of a great deal of work which he was not really in a position to do efficiently:

This Committee is to act as an Academic Board similar to the one at West Point and the chairman corresponds to the president of that board and is substantially the dean of the School.

He is expected to devote from ten to twelve hours per day to the work.

It is one of his duties to obtain instructors and recommend their appointments to the University; also to recommend the discharge of unsatisfactory instructors.

He is to have complete charge of all instruction and is to attend the classes frequently to see that the instruction is of the proper character.

He is to interview all students and, together with the Commandant, is to decide as to the personal efficiency of each man, a report of which is to be sent to Washington.

All delinquent or backward students are to appear before him and he is to recommend to the Commandant the action which should be taken in each case.

He is to have charge of the records and furnish the Commandant weekly reports which are to be forwarded to Washington.

He should have a good stenographer and a copyist in his office, which should be adjacent to that of the Commandant to permit frequent conferences.

The Commandant is the Government representative and is to have complete charge of the men and their military instruction. Also he is the Government representative to judge if the University is living up to the contract.

All communications from Washington to the School come to the Commandant and he is the one to forward all communications to the Government.

Upon the request of the President of the Academic Board the Commandant will order men to confer with him.

The Commandant's dealings with the instructors will be through the President of the Board.

After a more careful investigation, Major Bingham found that a great deal of excellent work was being done at Cornell, and, in spite of the difficulties and misunderstandings mentioned he was well pleased with the Schools' efforts by the time he left.

The President of the Academic Board was immediately made a regular member of the Staff of the School and entered into the active duties of the office. The Board had already

devised forms for reporting marks, examination papers and quiz sheets, and now proceeded to meet during the week, to consider matters of importance regarding equipment and instruction and again after the marks had all been turned in at the end of the week to recommend men to be turned back or discharged for failures in studies and efficiency. The President of the Academic Board established headquarters adjacent to the Commandant's office in Schoelkopf Hall and employed a secretary and recorder. Slight changes in schedule were made to conform more exactly to the service calls sent from Washington. Meetings of the faculty were held and the work and purpose of the ground schools were carefully explained to them. Within a week things were moving much more smoothly and the Commandant had been relieved of a great deal of the burden of reports which were now presented to him in complete form. One of the instructors in military subjects, F. D. Saunders, received his commission about this time and acted as Adjutant for the Commandant. A retired sergeant of Signal Corps arrived to help in the office, and clerks and accountants were added to the staff.

The first curriculum sent to the School, May 19, 1918, simply gave an outline of the number of hours for each subject and left it to the Commandant to arrange in which week each was to be given.

The subjects were not grouped into different Departments, and included such subdivisions as "Less Etiquette", "Formation of Troops", "Sailmaking and Splicing", "Tools", and such general heads as "Cross Country and General Flying", "Theory of Flight", which permitted duplication of the same work under different instructors unless carefully supervised. Engines and Machine Guns received more time than any other subjects except the military. This schedule only provided a total of 177 hours. A letter on June 1, outlined the ground to be covered in the different subjects.

Discussion continued on Page 12

	<u>Laboratory Instruction</u>	<u>Lectures</u>	<u>Total Hours</u>
Stationary Engines	20	3	23
Rotary Engines	6	2	8
Magneto		1	1
Instruments		2	2
Sailmaking & Splicing	3		3
Rigging & Landing Gear	9		9
Machine Gun	18	2	20
Tools		2	2
Artillery Observation and Miniature range	12	6	18
Bombs & Bombing	2	2	4
Cross Country & General Flying		2	2
Map Reading and Re- connaissance		8	8
Meteorology		1	1
Astronomy		1	1
Loss Etiquette		1	1
Photography (Camera, use of)		1	1
Wireless and Signalling	14	6	20
Types of machines		1	1
Theory of Flight		2	2
Formation of Troops		4	4
Military Drill			20
Physical Drill (Calisthenics)			20
Care of machines		2	2
May 19, 1917			<hr/> 177

On June 11, 1917, a revised curriculum was received. In this curriculum were included recommendations of textbooks and references for instructors, and detailed description of each course. The subjects were combined into several "Examination Groups", each group including subjects of the same nature. This curriculum prescribed what should be taught in the first three weeks of the course, "Junior Wing", or in the last five weeks, "Senior Wing", but did not prescribe any particular week for the different subjects.

The Committee on Studies arranged a schedule of hours to conform to this outline. It was impossible to conform exactly to the service calls prescribed at first until plans could be made for messing the cadets earlier in the morning and more adequate lavatory facilities provided.

Discussion continued on Page 27

COURSE OF STUDY FOR JUNIOR COURSE IN MILITARY AERONAUTICS.

No. of Days.	No. of hrs.	Total	No. of
Subject	or	Recitation	hours.
1. MACHINES			
a. Stationary engines	20	6	26
b. Rotary engines	6	6	6
c. Magneto theory	1	1	1
2. THEORY OF FLIGHT			
X. History of Flying	1	1	1
Y. Theory of Flight	2	2	2
a. Description of simple machines	1	1	1
b. Types of machines	1	1	1
c. Care of machines	2	2	2
d. Repair of machines	3	3	3
(Sailmaking and splicing)	3	3	3
e. Rigging and landing gear	9	9	9
f. Tools	2	2	2
3. CROSS COUNTRY AND AERIAL FLIGHT			
a. Flying	5	5	5
b. Meteorology	5	5	5
c. Astrology	1	1	1
d. Photography	2	2	2
e. Instruments and compasses	4	4	4
f. Transportation by Motor	2	2	2
4. AERIAL OBSERVATION			
a. Artillery observation	5	5	5
b. Miniature range	10	10	10
c. Map reading	4	4	4
d. Reconnaissance	4	4	4
e. Contact Patrol	1	1	1
5. GUNNERY			
X. *Machine Guns (elementary)	15	15	15
a. Fighting in Air	1	1	1
b. Machine Guns (advanced)	14	14	14
c. Bombs and bombing	2	2	4
6. SIGNALING AND WIRELESS			
A. *Telegraphy (elementary)	15	15	15
a. Radio	2	3	5
b. Telegraphy & Signalling	15	15	15
7. MILITARY STUDIES			
A. Military Policy of the U.S.	1	1	1
B. Military Principles	1	1	1
C. Administration & Military Law	3	3	3
D. Army regulations	3	3	3
E. Organization of modern armies	1	1	1
Total			183

Subjects marked* are given in the Junior Wing 50

Senior Wing 150
Total 183

STUDIES OF THE SCHOOL OF CIVIL SCHOOLS OF MILITARY ACADEMIES

COMBINES:

TOPICS:

1. Engines
 - Stationary engines
 - Rotary engines
 - Magneto theory
2. Theory of flight
 - *Theory of flight
 - Types of machines
 - Care of machines
 - Repair of machines (sailmaking and splicing)
 - Rigging and landing gear
 - Tools
 - Manufacture of aeroplanes
 - *History of flying
3. Cross-country and general flying
 - Meteorology
 - Astronomy
 - Photography
 - Instruments and compasses
 - *Flying
 - Transportation by motor
4. Aerial Observation
 - Miniature range (Artillery Observation)
 - Map reading
 - Reconnaissance
5. Gunnery
 - Machine Guns (Elementary)
 - Machine Guns (Advanced)
 - Bombs and Bombing
6. Signalling and Radio
 - Radio
 - Signalling
 - *Telegraphy (Elementary)
7. Military Studies
 - *Military Policy of the U. S.
 - *Military Hygiene
 - *Administration and Military Law
 - *Army regulations
 - *Organization of modern armies.

NOTE: Subjects marked * are given in the Junior Wing
Other subjects are given to the Senior Wing.

"At the completion of his course of study and before graduation and recommendation for transfer to flying schools or flying squadrons each student must pass written examinations in (1) the operation and care of aeronautical engines; (2) theory of flight, including the construction, care, and rigging of aeroplanes; (3) Cross-country and general flying including meteorology, astronomy, photography, and instruments; (4) Aerial Observation, including artillery observation, miniature range, map reading, and reconnaissance; (5) Maneuver, including the care and operation of machine guns, bombs and bombing; (6) Signalling and Radio; (7) Military Regulations, including the formations of troops, customs of the service, and essential features of army organization. The papers of these written examinations will be set by a board of examiners appointed by the Commandant of the School and will include at least one commissioned officer. In setting these papers general and practical questions will be used. The chief object to be borne in mind when reading the papers should be to ascertain whether the candidate has a good knowledge of the subject from a practical standpoint."

LIST OF ABBREVIATIONS AND SYMBOLS USED.

A.A.G.- - - - -Awards'-Automobile Guide
Aer. - - - - -1st Annual Report Nat. Adv. Com. on Aeronautics
Aer. 2 - - - - -2nd " " "
Av. and Weather- The Aviator and the Weather Bureau (Carpenter)
Barb. - - - - -The Aeroplane Speaks (Barber)
B.G.S.- - - - -Fighting in the Air (British Gen. Staff)
Coop. A. A.- - Cooperation of Aircraft with Artillery
(2 pamphlets)
Ex. A. R. - - -Extracts from U. S. Army Regulations
G. C. L. - - - Military Aeroplanes (Loening)
H.A.B.- - - - Handbook of Aerial Bombs (British)
H.F.- - - - -Hints for Young Instructors (R.F.C. British)
L.A.R.- - - - - Operation and Technical Use of the Lewis
Automatic Rifle.
L.W.R. - - - - - Fighting in the Air (Rees)
M. 2A -v- - -Manual No. 2A, 1914 (C.S.O.)
Mag. Comp. - --Magnetic Compass in Aircraft(Creagh-Osborne)
M.C.M.- - - - Manual for Courts Martial
M. H. - - - - Military Hygiene (Keefer)
Mil. U. S. - - Military Policy of the U. S. (Upton)
M.L.N.- - - - Manuscript Lecture Notes (S. M. A.)
M. M. R. - - - Military Sketching and Map Reading (Grieves)
N. O. - - - - Reprint from "Night Operation".
Nom. Aer. - - -Report No. 9 (Nat. Adv. Com)
N.R.A. M. - - -Notes on Rigging for Air Mechanics.
P. N.- - - - Photographic Notes (British)
Radio - - - - Radiotelegraphy (U.S. Sign. Corps)
Rept. 8 - - - Report No. 8 Nat. Adv. Com. on Aer.
Sig. A. A. - - Signals between Aeroplanes and Artillery
T. B. Aer. - - Text-book of Aerial Gunnery (British)
T. M. G. - - Training of Aerial Machine Gunners (British)
T. M. R. F.1&2 Training Manual Royal Flying Corps.
T. N. - - - - Technical Notes Royal Flying Corps.
U.S.G.D.- - - U.S.Manual Interior Guard Duty.
U.S. Sig. - - - Signal Book U. S. Army 1916

(1) STATIONARY ENGINES (20 hours Lab., 6 hrs. lecture -
total, 26 hrs.)

Curtis - Comparing points of difference in other
engines as time and circumstance permits. (T.H. pp.
19-23. M.L.R. "Curtis Engines")

RECIPROCATING ENGINES (References A.A.G. p. 27ff, 39.
T.H.R.F. Part 1 pp. 42-80)

Power - Explosion - Four-stroke cycle
Detailed description of the working of a
gasoline motor.

VALVE (References A.A.G. pp 24ff, 30, 30ff, 32, 33)

Arrangement of the valves - Tappets - Springs,
Mechanically and automatically operating valves
Valve settings - Valves in action

PISTON (References A. A. G. 39ff, 124, 242, 243, 244)

Described - Diameter in relation to cylinder -
Piston spring rings - Number

THE CARBURETOR (References A. A. G. (53 - 124. International
Report 2, 53, - 552)

System - Float chamber - Gasoline Supply
Diagram - Jet chamber.

THROTTLE AND AIR VALVE (References A.A. G. 30, 33, 37, 124, 241)

Regulation of mixture.

LUBRICATION (References A.A.G. 34 - 36)

Oil film - Classes of oil used - Splash lub-
rication - Forced Lubrication - Pressure gauge.

MUFFLER (References A. A. G. 19, 42, 244-5)

MAGNETO AND IGNITION (References A. A. G. 125 - 208)

Battery and coil ignition - Magneto ignition
Fundamental principle - High tension wires - Coils -
Distributor - Make and break - Spark plugs - Tests -
Easily recognizable defects - Backfiring - Tools and
equipment for overhauling magnetos - Parts Ordering -
Care - Overhauling records.

COOLING (References A. A. G. 43 - 53)

Effects of overheating - Water - Air)

THEORY OF ENGINES (References A. A. G. 53, 124)

How expressed - Heat dissipation * Maximum of Efficiency - Mixture - Large ratio of expansion - Spark-Temperature - Failure to start - Faulty mixture - Compression.

(2) ROTARY ENGINES (6 hrs Lab., 2hrs. Lect. - Total, 8 hrs.)

Gnome - Monosoupapa. (References, T. N. 10-34 -MLN.
{"Gnome engines"})

(3) MAGNETO THEORY (1 hr. lecture - total 1 hr.) (A.A.G.145-176)

THEORY OF FLIGHT

*THEORY OF FLIGHT (2 hrs. lect.- total 2 hrs.)

(References, Barb. 55-70, G. G. L. 25-105, Aer.
25-100 (Technical) Aer. 2, 555-627, M.L.N.
"Landon - Theory of Flight" "LaGrange-
Theory of Flight")

TYPES OF MACHINES (1 hr. lect. - total 1 hr.)

(References, Barb. 145ff, T. N., Plates
1 - 39 G. G. L. 13 - 25)CARE OF MACHINES OF AIRCRAFT (2hrs. lect. 2 hrs. -
total (References T. N. T. Part 1, 5-7, M. L. N. "Manual
of Aeroplane Care" "Care and Maintenance of Machines.")Care of fabric, woods, internal bracing wires,
turnbuckles, engines, propellers, bolts, and nuts. Keeping
records.Care of aeroplane hangars, cleaning-out - packing-
floors-benches-tool boxes - tools - stands - clothing -
spare parts - protection against fire and moisture- keeping
of bulletin boards.

REPAIR OF AIRCRAFT AND ORGANIZATION OF WORKSHOPS (3 hrs. lect.)

total 3 hrs.)

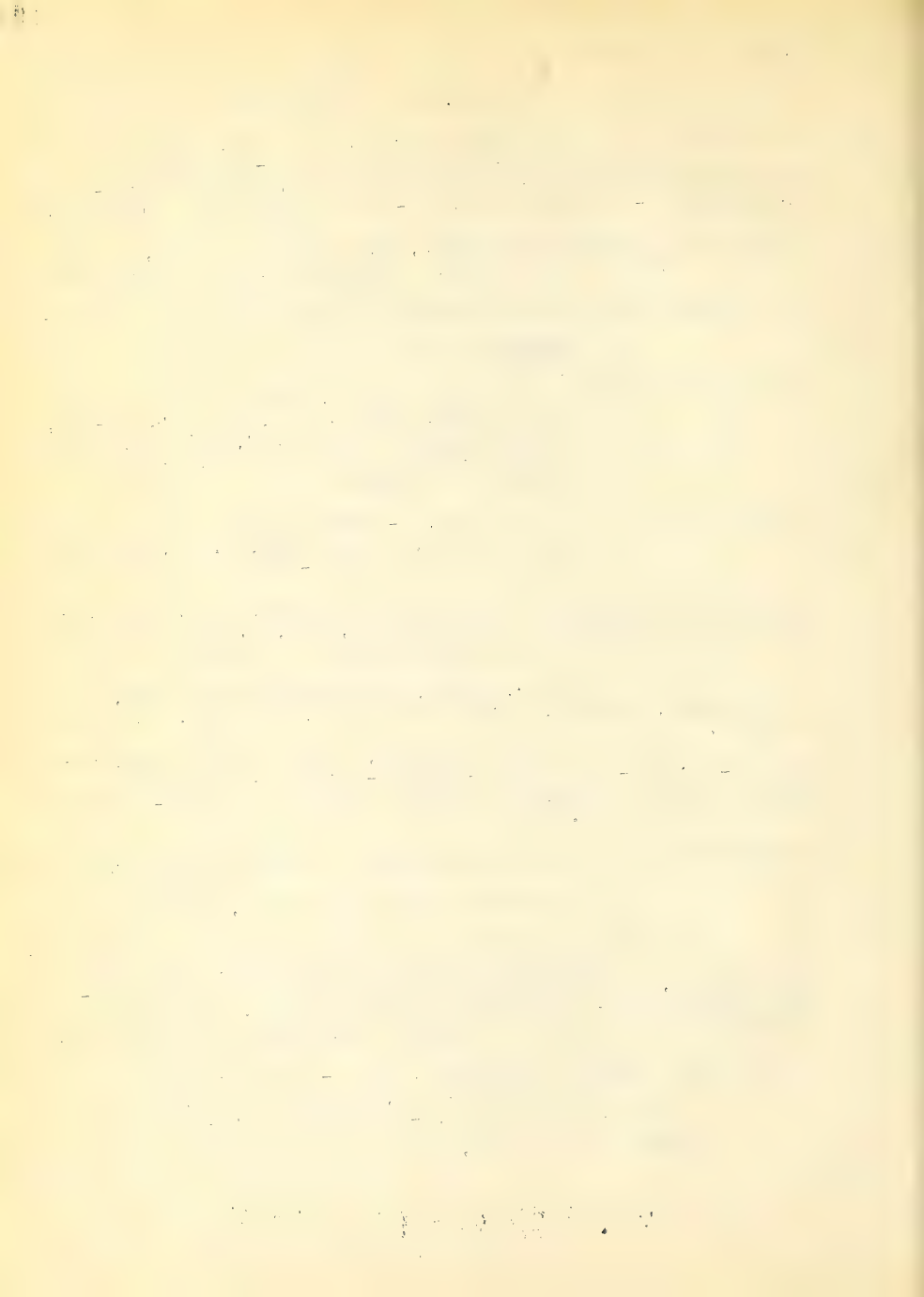
(References T. N. T. Part 1, 10-13)

Personnel - Examining and dismantling of aeroplanes -
Care of damaged parts - Periodical inspection - Repair work
(a) engines, (b) fuselages (c) fabric - Care of machinery *Stores
and spare parts - Provision for spare parts - Condemned parts -
Storage of spare planes - General organization of workshops.

FLIGHTING AND LANDING GEAR (9 hrs. Lab. - Total 9 hrs.)

References Barb. - 114, H.R.A.M. M.L.N. "Rigging"
T.M.R.F. Part 1 17, - 42 G.G.L. 121 - 136)

Selection of metal, wood fabric -



parts - Use of cable or piano wire - stretching cables - greasing pulleys and tubing - fitting pipes.

TOOLS (2 hrs. lect. - total 2 hrs.)

(References T.M.R.F. 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000)

NOMENCLATURE OF AEROPLANES (4 hrs recitation - total 4 hrs)

(References Barb. 133 - 144. Aer. 2 31 - 37. Nom. Aer.)

Definitions of the following:

Aerofoil, Aileron, aircraft, aeroplane, airspeed meter, altimeter, anemometer, angle, aspect ratio, axis of aircraft, ballonet, balloon, bank, banking, rudder, biplane, body of airplane, cabre, camber, capacity, center, chord, controls, critical angle, decalage, dihedral angle, propeller, dirigible, disc area of a propeller, diving rudder, dope, drag, drift, elevator, engine, enteriang edge, fins, flight path, float, fuselage, gap, glide, glider, glide angle, guy, head resistance, helicopter, inclinometer, keel plane area, kite, kite balloon, landing gear, lateral stability, leading edge, leeway, lift, lift bracing, lifting capacity, load (pull), loading, longitudinal stability, metacenter, monoplane, motor, nacelle, Natural stability, nose dive, ornithopter, pitot tube, propeller, pusher, rudder, rudder of a propeller, rib, right, rigid, dirigible, rudder, side slipping, skidding, skids, slip, sliding machine, spread, stability, stabilizer, stagger, stalling, statoscope, step, step, stream line flow, stream line shape, strut, sweep back, tail, tail fin, thrust deduction, tractor, trailing edge, triplane, truss, volometer, volplique, volplane, wake gain, warp, wings, wing loading, wing rib, wing spar, yaw.

*HISTORY OF FLYING (1 hr. lect. - total 1 hr.)

(References M.L.N. "History of Aviation")

CROSS-COUNTRY AND ENDURANCE FLYING

*FLYING (3 hrs. lect. - Total 3 hrs.)

(References T.M.R.F. Part 1 100 - 113. H.F. Barb. 38-54 M.L.N. "Cross - Country flying")

Maps - Selection of Objects, etc., as guides - towns, railroads, water, steep heights, forced landings, wind, time height.

METEOROLOGY (3 hrs. lect. - total 3 hrs.)

References T.M.R.F. 113 - 126 M. L. N. "Air Currents". "The Aviator and the Weather Bureau" Aer 52-75)

THE ARMY LIBRARY

WASHINGTON, D.C.

THE UNIVERSITY OF CHICAGO

Atmospheric changes - Atmospheric pressure - Differences of pressure with increasing height - Isobars - Wind - Gustiness of wind - Forecasting - The cyclone, features, altering temperature, symptoms, squalls, anticyclone, secondary depression wedge - line squalls barometric rise - Fog - Conditions of atmosphere affecting aviation, - how ascertain, small balloon, clouds, weather map, known surface wind

ASTRONOMY (1hr. lecture - Total 1 hr.)

Conjunctive stars
" constellations.
" Planets.

Photography (2 hrs. lect. - Total 2 hrs.)

(References I.L.I. "Book Automatic Camera".
"Elementary Photography". 3. 1. 2 - 4. 1. 1.)

The camera, - lenses, shutter, stops, films, dark-room, cycle of operations, developing, fixing bath, washing, drying, printing, - Causes of non-success and correction - Automatic Aero Camera - Description of lens, shutter, film.

INSTRUMENTS AND COMPASSES (4 hrs. lecture - Total 4 hrs.)

(References T. M.R.F. 80-100

Map Comp.

I.L.I. "Notes on the Compass
1 & 2". Aer. 2 25-28, Rept. 8)

Mercurial barometer, - errors, corrections, temperature, imperfect vacuum - Aneroids and barographs, - errors - Watch-Tachometer - Inclinator - Map board or case - The Magnetic Compass, - Magnetic Meridian, deviation of the needle in the aeroplane, placing the compass, magnetic compass in aircraft, deviation error - Military Aeroplane Compass, - composition of liquid in bowl, suspension of compass card.

TRANSPORTATION BY MOTOR (2hrs. Lect. - Total 2 hrs.)

(References T.M.R.F. 125 - 144)

Engines, - Bearings examined, piston rings, grinding valves, variable ignition - Routine examination of car or truck, before use, daily, weekly, - Care of grease and oil caps - Care of clutch, gears, differential gears and chains, brakes, - cleaning and washing cars - care of tires, - cuts, pumped full, spare wheels, alignment of wheels, brakes applied gently.

AERIAL OBSERVATION

ARTILLERY OBSERVATION (5 hrs. lect. - Total 5 hrs.)

(References T.M.R.F. Part 2, 46-49 Signal.
Coop A. A. 2 Pamphlets)

Cooperation of aeroplanes with artillery-signals
to artillery - Location of enemy battery-Observation of fire. -
Location of targets - Duties of artillery patrol - Reports.

Contract Patrol (1 hr. lect. Total 1 hr.)

Object - Information sent to Artillery-Methods of communication between infantry and airplanes-Methods of communication between aeroplanes and headquarters of Corps or Divisions - Signals between Aeroplanes and Infantry.

MINIATURE RANGE (12 hrs Lab. - Total 12 hrs.)

(References M.L.N. "Specifications & Notes on Miniature Range". "Use of the Clock Code")

Practical test - ability to hit mark in five tries or less.

MAP READING (4 hrs. lect. - Total 4 hrs.)

(References M.M.R. 19-27, 28-35, 62-76.)

1. Map Reading.

Orienting the map,- True and magnetic meridians,- scaling distances, Magnetic and true azimuths-Extractor - Practical problems. Conventional signs as, - canal or ditch, aqueduct, canal lock, wagon roads (metalled, good, poor, or private, on small scale maps), trail or path, railroad (railroad of any kind or single track, double track, juxtaposition of, electric, in street or wagon road, steam, electric), tunnel, railroad station of any kind, telegraph line symbol, along road, along road on small scale maps, along trail) electric power transmission lines, bridges (general symbol, draw-bridges, truss, foot suspension, arch, pontoon) ferries, fords, (general symbol, infantry and cavalry, cavalry), dam, good landing place for aeroplanes, possible landing place for aeroplanes, buildings in general, ruins, church, hospital, schoolhouse, postoffice, telegraph office, waterworks, windmill, city, town or village, city town or village, city town of village generalized, same on small scale maps, fencing (fence of any kind or board fence, stone, wire-wire hedge), streams in general, intermittent streams in general, intermittent streams, lake or pond in general, salt pond, intermittent lake or pond, sand dunes, levees, grass land, regimental headquarters, brigade headquarters, division headquarters, corps headquarters, infantry in line, infantry in column, cavalry in line, cavalry in column, mounted infantry, artillery, sentry, vidette, pickett cavalry and infantry, support cavalry and infantry, wagon trains, adjutant general, quartermaster, commissary, medical corps, ordnance, signal corps, gun battery, mortar battery, fort, redoubt, camp, battle, trench, abettis, wire entanglement, palisades, contact mines, controlled mines, demolitions, line craters, ditch craters, fortified, ditch, ditch filled with water.

RECONNAISSANCE (4 hrs. lect. - Total 4 hrs.)

(Reference: P.M.R. F. Part 2, 22-42. T.G.S. 171-175, B.G.S. 17-18)
(M.L.N. "Reconnaissance")

Stratigical and tactical methods of accomplishment-
Orders - Pilots and observers - Reports'

GUNNERY

FIGHTING IN THE AIR (1 hr. lect. total 1 hr. B. G. S. 1-22, L.W.R. 1 - 17 T. M.R. F. Part 2 46-50. M.L.N. "Notes on Aeroplane Fighting in Single seater scouts", "Fighting in Air".) Necessity of fighting - Elements of offense - Factors of Success - Surprise - Power of Manoeuvres - Effective use of weapons - Choice of Objectives - Formation flying - Principles - offensive patrols - Armanent - Sighting the enemy - Target - Estimating speeds - Ranges - Importance of Gunnery Engagement - Tracer bullets - Fighting tactics - Fire Tactics - Bomb raids - Formation.

MACHINE GUNS (*Elementary, 15 hrs. lab. - Total 15 hours.1)
(Advanced, 15 hours. Lab. - Total, 15 hrs.)

(Reference: P.M.R. F. Part 2, 22-42.)

THE LEWIS GUN (Based on "Operation and tactical use of the Lewis automatic rifle")

1. Mechanism and drill.

Chief features - few parts, operation by trapping gases, air cooling, radiator, velocity, recoil, portability, buttstocks, feed by magazine.

Parts of gun-barrel group, barrel, mouthpiece, radiator, radiator casing, rear working, band, clamp ring, gas fittings, barrel bands and gas chamber, gas regulator, cylinder, receiver group, bolt bar, magazine, foot, cartridge guide spring, ejector opening, band spring, foot screw, rear casing, working parts, piston rod, bolt, feed operating mechanism, feed arm, stop and return handle, magazine, trigger, charging handle, safety slide, butt stock, magazine, shell collector.

Operation of the gun-unloading, forward movement, backward movement, action of gases and spring, ejection, feeding.

Stripping and assembling gun.

Adjustment of magazine gas pressure balance, setting the tension, increase, decrease.

Gas Regulator.

Before firing-bore, mainspring, cleaning and oiling magazine.

After firing-unloading, cleaning, oiling.

During firing-not cleaning possible.

BOMBS AND BOMBING (4 hrs. lect. - Total 44 hrs.)

(Reference: Handbook of Aerial Bombing
Chaps. 1 & 2)

1. Explosives - Trinitrofluorene - stable, no deterioration with age, impervious to frost and damp, not highly sensitive. Tetrayl Ammonium Nitrate - affected by damp - Incendiary mixtures - Detonator - Intermediate exploder - Main charge - Fuse giving delay to detonation.

2. Fuses, exploders and detonators - plunger - detonator needle - vane - preparation for flight - action - rotation of vane - descent of needle - pressure plate - impact - delay compositions - two methods of exploder action - detonators quickly affected by damp.

SIGNALLING AND RADIO

RADIO (2 hrs. lab. 3 hrs. lect. - Total 5 hrs.)
(Reference T. N. 4-7 Radio.)

Difference between direct and alternating current - an oscillation - amplitude of oscillation - damping - a period - resonance of two electrical circuits - a transformer - closely coupled circuit - loosely coupled circuit - directly connected circuit - inductively connected circuit - function of the gap - two types of spark gap now in use - factors on which the capacity of a condenser depend - parts of closed or oscillating circuit - parts of the open or radiating circuit - functions of the detector - two types of detector now in use - wave meter - Use of hot wire ammeter - conventional diagrams of connections of wireless set - method of charging batteries.

TELEGRAPHY AND SIGNALLING *Elementary 18 hrs. lab. - Total 18 hrs.)
(Advanced 15 hrs lab.- Total 15 hrs.)
(Reference U.S. Sig. 7-19, 20-22, 23-25, Sig. L. A.)

*General instructions for signalling- International Morse and General Service code - visual signalling - Ardois system - Letter codes - Conventional and preconcerted signals - Infantry company signal flags - Signals between artillery and aircraft.

NOTE: Necessity for daily practice in sending and receiving International Morse Code.

*MILITARY STUDIES.

*MILITARY POLICY OF THE UNITED STATES (1 hr. lect. - Total 1 hr)
(Reference Mil. U.S.A.M.F. Times Current Hist. March, April, May)

General Military policy. Policy since 1914.

*MILITARY HYGIENE (1 hr. lect., - Total 1 hr.)
(Reference H. H. H. L. P. "General Sanitary Rules")

General rules - location and sanitation of camps -
prevention and treatment of disease - personal hygiene.

*ADMINISTRATION AND MILITARY LAW (3hrs. lect.- Total 3 hrs.)
(References N.O. 1-56. M.C.M.)

Military government - Martial law at home - Martial
law applied to the Army, Military Law - Kinds, conduct and
functions of courts martial - misdemeanors and arrests -
Judge advocate. duties - Gathering information - Testimony -
Practical example of general court martial.

*ARMY REGULATIONS (as lectures 5 & 6 of Junior Wing)
(References For. A. R. U.S.G.D.)

Discipline - Command - Appointment and promotion of
commissioned officers - Transfer or exchange of officers -
Leaves of absence to officers - Retirement and resignation
of officers - Furloughs to soldiers - Transfer of enlisted men
Deserters - Discharges and certificates of disability - Re-
giments and battalions Troops, batteries and companies - Funerals
Honors, courtesies and ceremonies - Property - Articles of War
and their meaning - Interior guard duty.

*ORGANIZATION OF ARMIES (4 hrs. lect. - Total, 4 hrs.)
(References H.L.N. "War Organization",
"Formation of the German Army", "French
Flying Corps." "Royal Flying Corps in the
Field")

FRANCE - GERMANY - BRITISH - AMERICAN.

WAR DEPARTMENT

Office of the Chief Signal Officer

The following service calls will be observed at the Schools of Military Aeronautics and are prescribed for the Senior Wing. This schedule supersedes all former orders.

	Daily	Sat.	Sun.
Reveille, First Call	5:30	5:30	7:30
Assembly	5:40	5:40	7:40
Calisthenics	5:50	5:50	--
Mess Call	6:10	6:10	8:00
Inspection of quarters & equipment		7:00	
School Call	7:00		
Assembly	7:05		
School Call	8:00	8:00	
Assembly	8:05	8:05	
School Call	9:00	9:00	
Assembly	9:05	9:05	
School Call	10:00	10:00	
Assembly	10:05	10:05	
School Call	11:00	11:00	
Assembly	11:05	11:05	
Recall	11:55	11:55	
Mess Call	12:00	12:00	12:30
School Call	2:00		
Assembly	2:05		
School Call	3:00		
Assembly	3:05		
Drill Call	4:00		
Assembly	4:05		
Recall	5:00		
Retreat, First Call	5:55	5:55	5:55
Assembly	6:00	6:00	6:00
Mess Call	6:15	6:15	6:15
School Call	7:55	--	--
Recall	8:55	--	--
Tattoo	9:10	10:00	9:10
Taps, lights out.	9:30	11:00	9:30

By authority of the Chief Signal Officer

(Signed) Major William
Major, A.S., S. C. U.S.A.
C.I.C. Schools Division

JUNIOR WING.

	Daily	Sat.	Sun.
Reveille, First Call	5:30	5:30	7:30
Assembly	5:40	5:40	7:40
Calisthenics	5:50	5:50	
Mess Call	6:10	6:10	8:00
Inspection, First Call	7:00		
Assembly	7:05		
Inspection of Quarters & Equipment		7:00	
Drill Call	7:30	7:30	
Assembly	7:35	7:35	
School Call	9:00	9:00	
Assembly	9:05	9:05	
School Call	10:00	10:00	
Assembly	10:05	10:05	
Drill Call	11:00	11:00	
Assembly	11:05	11:05	
Recall	11:55	11:55	
Mess Call	12:00	12:00	12:30
School Call	2:00		
Assembly	2:05		
Infantry Drill, 1st Call	3:00		
Assembly	3:05		
Recall	5:00		
Retreat, First Call	5:55	5:55	5:55
Assembly	6:00	6:00	6:00
Mess Call	6:15	6:15	7:15
Buzzer Practice	7:55		
Recall	8:55		
Tattoo	9:10	10:00	9:10
Taps, lights out	9:50	11:00	9:30

By order of the Chief Signal Officer

On August 10, President Hildner wrote Professor Bennett:

"-----If men or men are needed on the staff, or anything else is needed to make the School efficient, I should be glad to have you inform me at once. My policy is to make this School of Aviation first-class in every respect, and, if possible, the best in the country". --

A suggestion from Major Bingham on August 23, 1917 resulted in the formation of a voluntary class in French, but the pressure of regular work and duties prevented its continuation for a very long period.

The work now presented under the schedule of June 11, 1917. In the early part of September the "Examination Groups" were each considered to form a Department of Instruction and a Head of Department was designed for each group. This materially increased the efficiency of the instruction almost at once.

On September 18, 1917, the Commandant received the following letter from the office of the Chief Signal Officer:

From: Office of Chief Signal Officer, Schools Division
 To: Commandant S.M.A., Ithaca, N. Y.
 Subject: Report of inspection.

1. The following extract from the report of an inspector is forwarded for your information and guidance.

2. "At Cornell the instructors are very good and in most cases have tackled their work with splendid spirit. The Commandant has both force and tact and has the office work so well in hand that he is able to spare time for lectures. The University co-operates to a surprising degree."

By direction of the Chief Signal Officer.

Hiram Bingham
Major, A.D.S.C., U.S.A.
C.I.C. Schools Division

The next change in the curriculum was dated Sept. 26, 1917 to conform to Stencil #37 Sept. 21, 1917, revising the course of study. This stencil gave a more concise outline of the courses. The work was arranged with a view toward eliminating the cadets of poor mentality in the Junior Wing, and those without technical ability in the fifth and sixth weeks; the object being to prevent such cadets from reaching the more advanced work in military aeronautics, a great deal of which was confidential, and then being discharged at the end of the eight weeks.

The amount of work for each week was outlined in the stencil and the Academic Board prepared a schedule of classes to conform. The class entering October 13, 1917 started on this new schedule.

Before the entire school could be placed on this schedule, a second revision of the curriculum arrived, dated November 1, 1917. It contained only slight changes in the arrangement of hours, these, with some modifications and additions to certain courses being made after consultation with flying officers. It was found that the entire school could be put on the new schedule on November 26, 1917, without interfering materially with the instruction, and this was done.

Discussion continued on Page 37

20

CURRICULUM FOR THE U.S. SCHOOLS OF MILITARY AERONAUTICS
Revised September 26, 1917.

Examination Group	Subject	Total Hours	Hours per Week								
			1	2	3	4	5	6	7	8	
1. <u>Military Studies</u> <u>110 hrs.</u>	Practical -----	88	21	21	21	5	5	5	5	5	
	Theoretical -----	20	8	8	4	-	-	-	-	-	
	Examination -----	2	-	-	2	-	-	-	-	-	
2. <u>Signalling and Radio</u> <u>40 hrs.</u>	Practical Signalling- (at least 1/2 hr. daily)	29	5	5	4	3	3	3	3	3	
	Field work -----	5	-	-	-	-	-	-	-	5	
	Radio -----	3	-	-	-	-	-	-	3	-	
	Examinations -----	3	-	-	1	-	-	-	-	2	
3. <u>Gunnery</u> <u>42 hrs.</u>	Practical ----- (at least 1/2 hr. daily)	32	5	5	4	3	3	3	3	6	
	Aerial Tactics -----	3	-	-	-	-	-	-	3	-	
	Bombs and Bombing ----	4	-	-	-	-	-	-	2	2	
	Examinations -----	3	-	-	1	-	-	-	-	2	
4. <u>Aids to Flight</u> <u>25 hrs.</u>	Theory of flight -----	4	-	-	-	2	2	-	-	-	
	Cross country flying--	3	-	-	-	-	-	-	3	-	
	Map Reading -----	8	-	-	-	2	2	2	2	-	
	Meteorology -----	3	-	-	-	-	-	3	-	-	
	Night flying -----	2	-	-	-	-	-	1	1	-	
	Instruments & compasses	3	-	-	-	1	1	1	-	-	
	Examination -----	2	-	-	-	-	-	-	-	2	
5. <u>Airplanes</u> <u>25 hrs.</u>	Types of machines-----	2	-	-	-	-	1	1	-	-	
	Nomenclature -----	2	-	-	-	2	-	-	-	-	
	Rigging -----	12	-	-	-	4	4	4	-	-	
	Care of machines -----	1	-	-	-	-	1	-	-	-	
	Repair of machines ----	6	-	-	-	2	2	2	-	-	
	Examination -----	2	-	-	-	-	-	2	-	-	
6. <u>Engines</u> <u>42 hrs.</u>	Principles of internal combustion engines, car- buretion, ignition ---	8	-	-	-	4	4	-	-	-	
	Laboratory work -----	28	-	-	-	9	10	9	-	-	
	Care of engines & tools	2	-	-	-	2	-	-	-	-	
	Types of engines -----	1	-	-	-	-	1	-	-	-	
	"Trouble shooting"-----	1	-	-	-	-	-	1	-	-	
	Examination -----	2	-	-	-	-	-	2	-	-	
7. <u>Aerial Observation</u> <u>24 hrs.</u>	Cooperation withartil- lery -----	4	-	-	-	-	-	-	4	-	
	Practical miniature range -----	12	-	-	-	-	-	-	6	6	
	Reconnaissance -----	2	-	-	-	-	-	-	2	-	
	Cooperation withinfantry-	1	-	-	-	-	-	-	-	1	
	Photography -----	3	-	-	-	-	-	-	1	2	
	Examination -----	2	-	-	-	-	-	-	-	2	
TOTAL --			308	39	39	37	39	39	39	38	38

WAR DEPARTMENT
Office of the Chief Signal Officer
WASHINGTON
Air Division
Schools Section

COURSE OF STUDY PRESCRIBED FOR
UNITED STATES SCHOOLS OF MILITARY AERONAUTICS

Revised September 21, 1917.

1. Military Studies:

- (a) Practical: Infantry drill through the school of the company, ceremonies, guard duty, physical training and first aid.
- (b) Theoretical: Lectures, demonstrations and the study of texts. (1) Military courtesy, esprit de corps and morale, (2) Organization and administration of the U.S. and Modern European Armies, (3) Army regulations, orders, army paper work and use of forms, (4) Military Law, both substantive and administrative, (5) Military hygiene.

2. Signalling and Radio:

- (a) Signalling: Students are required to send and receive at least 8 words per minute. Buzzing and visual signalling. Practice on miniature ground shutter; rate of 4 words per minute.
- (b) Radio: Elementary principles of Radio discussed and students required to know the parts of a simple wireless instrument. Demonstration of the same. Practical points on use and care of airplane wireless apparatus.

3. Gunnery:

- (a) Student is required to know the nomenclature of the gun thoroughly and tests in stripping, etc., are required. Sighting practice. Shooting on 25-yard ranges. Various types of machine guns discussed and studied.
- (b) Fighting in the Air: A discussion of Aerial tactics.
- (c) Bombs and Bombing: Fuses and detonators, various types of bombs, bomb-sights, bomb dropping, formation of a bombing raid, etc.

4. Aids to Flight:

- (a) Theory of Flight: A brief outline of the History of Flying with especial emphasis on the development of the airplane. The fundamental principles of aerodynamics taught graphically without the use of formulae.
- (b) Cross-country Flying: Elementary lectures; instructions for cross-country flight, action on a forced landing, reports.
- (c) Map Reading: Conventional signs, orientation, etc. Discussion of maps used at the front. Map interpretation emphasized, students go on field trips and are shown how to use maps.
- (d) Meteorology: Fundamental principles only - pressure, cloud formations, weather predictions, reasons for "bumps" and when to expect them.
- (e) Night Flying: One lecture and a night observation in astronomy - aiming to give a knowledge of a few of the conspicuous Northern constellations and planets. Landing grounds, flares, etc.
- (f) Instruments and Compasses: Brief description of various instruments used on an airplane. Calculation of compass courses.

5. Airplanes:

- (a) Types of Machines: A lecture aiming to give the pupil an idea of some service machines, their characteristics and purposes. Lecture on the properties and uses of woods, metals and fabric in airplane manufacture.
- (b) Nomenclature of Airplanes: The student is required to be able to give and thoroughly to understand all definitions included in the list given in "Report No. 9 of the National Advisory Committee for Aeronautics."
- (c) Rigging: How to align a machine. Practice in assembling and disassembling.
- (d) Care of Machine: The aim of this lecture is to impress upon the student necessity for the proper treatment of machines. Rules for proper care of a hangar.

- (e) Repair of Machines: Practical work in making wire and ~~type~~ ~~splices~~, patching torn wings, mending broken longerons, and soldering. Proper use of tools.

6. Engines:

- (a) The principles of internal combustion engines, two-cycle and four-cycle principle, carburetion, ignition, etc. Rotary and stationary aeronautical motors.
- (b) Laboratory work: Sketching of parts. Students assemble, disassemble overhaul and clean airplane engines.
- (c) Care of engines and tools: Proper care of engines with especial emphasis on the proper use and care of tools.
- (d) Types of engines.
- (e) "Trouble shooting"

7. Aerial Observation:

- (a) Lectures on co-operation of aircraft with artillery. Discussion of map-squaring, clock-code and code signals.
- (b) Practical Application of the above on miniature ranges where students are placed in gallery above a map painted to represent the ground as it looks from six to eight thousand feet. Lights arranged to simulate gun flashes.
- (c) Reconnaissance: Discussion of the various types of reconnaissance, how conducted and the duties of a reconnaissance pilot.
- (d) Lectures on co-operation of aircraft with infantry; methods of signalling.
- (e) Photography: How to make photographs from the air, types of cameras, interpretation of trench photographs.



8. General Remarks:

The course of study ordinarily lasts eight weeks and is divided into a Junior Wing of three weeks and Senior Wing of five weeks. The work of the Junior Wing consists of intensive training in Military discipline and drill, accompanied by a daily lecture on some military topic, daily instruction in the use of the machine gun and daily instruction in wireless telegraphy.

The work of the Senior Wing includes theoretical and practical instruction in military aeronautics as set forth in the course of study.

9. Examinations:

No candidate will be sent to a flying school who has not passed all final examinations in the ground school. Candidates who fail but have an excellent record for conduct and diligence may at the option of the Commandant be permitted to repeat examinations. Those who fail to pass or whose record for conduct and diligence is not creditable will be recommended for discharge. Successful candidates are marked as having passed, or passed with honor, and are given certificates of graduation issued by the Chief Signal Officer on the recommendation of the Commandant of the School.

10. Organization:

The organization of a School of Military Aeronautics includes a Commandant, who is an Army officer selected by the Chief Signal Officer to be the commanding officer of the Post at which the school is located. Assisting him is an Adjutant and a Supply officer and a President of the Academic Board appointed by the President of the University or technical school which is under contract with the War Department to give the tuition called for in the prescribed curriculum for U.S. Schools of Military Aeronautics.

For the purposes of administrative drill and discipline the candidates at the Schools of Military Aeronautics are organized as a Regiment of two Wings, divided into three and five Squadrons respectively. Each squadron consists of the members of one class divided into three Flights. Acting Regimental, Wing, Squadron and Flight officers and non-commissioned officers, are temporarily appointed from the candidates. Candidates are quartered in barracks, and eat at a regular mess.

The system of discipline follows that of the Military Academy at West Point so far as practicable. Calisthenics and infantry drill are required daily in addition to the course of technical study.

11. The objects of the Schools of Military Aeronautics are:

1. To teach candidates their military duties and develop soldierly qualities.
2. To eliminate those who are mentally or morally unfitted to become flying officers.
3. To give the necessary preliminary training in military aeronautics.

By direction of the Chief Signal Officer.

Hiram Bingham,

Major, A.S., S.C., U.S.R.
Dir. Sch. Mil. Aeronautics.

CURRICULUM FOR THE U.S. SCHOOLS OF MILITARY AERONAUTICS

Revised November 1, 1917.

36

Examination Group	Subject	Total Hours	Hours per week							
			1	2	3	4	5	6	7	8
1. <u>Military Studies</u> <u>115 hrs.</u>	Practical -----	85	20	20	20	5	5	5	5	5
	Theoretical -----	20	8	8	4	-	-	-	-	-
	Saturday Inspection ---	8	1	1	1	1	1	1	1	1
	Examination -----	2	-	-	2	-	-	-	-	-
2. <u>Signalling and Radio</u> <u>35 hrs.</u>	Practical Signalling --	30	5	5	5	3	3	3	3	3
	(at least 1/2 hr.daily)									
	Radio-lectures-non tech- nical -----	3	-	-	-	-	-	-	3	-
	Examination -----	2	-	-	1	-	-	-	-	1
3. <u>Gunnery</u> <u>50 hrs.</u>	Practical -----	40	5	5	5	5	5	5	5	5
	(at least 1/2 hr.daily)									
	Aerial Tactics -----	3	-	-	-	-	-	-	1	2
	Bombs and bombing ----	4	-	-	-	-	-	-	2	2
	Examination -----	3	-	-	1	-	-	-	-	2
4. <u>Aids to Flight</u> <u>24 hrs.</u>	Theory of flight -----	4	-	-	-	2	2	-	-	-
	Cross country flying --	2	-	-	-	-	-	-	2	-
	Map reading -----	8	-	-	-	-	2	2	2	2
	Meteorology -----	3	-	-	-	-	-	3	-	-
	Night Flying -----	2	-	-	-	-	-	-	1	1
	Instruments & compasses	3	-	-	-	-	-	1	1	1
	Examination -----	2	-	-	-	-	-	-	-	2
5. <u>Airplanes</u> <u>24 hrs.</u>	Types of machines -----	1	-	-	-	-	1	-	-	-
	Nomenclature -----	2	-	-	-	2	-	-	-	-
	Rigging -----	12	-	-	-	4	4	4	-	-
	Care of machines -----	1	-	-	-	-	1	-	-	-
	Repair of machines ----	6	-	-	-	2	2	2	-	-
	Examination -----	2	-	-	-	-	-	2	-	-
6. <u>Engines</u> <u>39 hrs.</u>	Principles of internal- combustion engines, car- buretion, ignition -----	8	-	-	-	4	4	-	-	-
	Laboratory work -----	25	-	-	-	9	8	8	-	-
	Care of engines & tools	2	-	-	-	2	-	-	-	-
	Types of engines -----	1	-	-	-	-	1	-	-	-
	"Trouble shooting" -----	1	-	-	-	-	-	1	-	-
	Examination -----	2	-	-	-	-	-	2	-	-
7. <u>Aerial Observation</u> <u>25 hrs.</u>	Cooperation with artillery	4	-	-	-	-	-	-	4	-
	Practical miniature range -----	12	-	-	-	-	-	-	6	6
	Reconnaissance -----	2	-	-	-	-	-	-	2	-
	Cooperation with infan- try -----	1	-	-	-	-	-	-	-	1
	Photography -----	4	-	-	-	-	-	-	1	3
	Examination -----	2	-	-	-	-	-	-	-	2
TOTAL----			312	39	39	39	39	39	39	39

Note:- A week of 39 hrs.means 4hrs.A.M.;and 3 hrs P.M.,
except Saturday



STUDENT OFFICER ENGINEERS

The University was then asked to prepare a four weeks' course for Student Officer Engineers. A class of 50 was to arrive December 15th and instruction started December 17th, 1917. The course was to train them for engineer officers in aero squadrons. Their work consisted of thirty-five hours of military work, including paper work and Saturday inspection; twenty-five hours in Gunnery and Bombs and Bombing; seven hours in Airplanes, and fifty-six hours in Engines, including principles, types, and care of engines, "trouble shooting", and care of tools.

The mixing of officers with enlisted cadets was detrimental to discipline and efficiency in instruction and so after three weeks of instruction the officers were transferred to the Massachusetts Institute of Technology.

SCHOOL OF MILITARY PHOTOGRAPHY

In December 1917 the School Division arranged with the University to send two squadrons of thirty men each for instruction in photography, one squadron to arrive about December 1, 1917 and the other about January 1, 1918. The Government was to furnish the instructors and the University was to allow the cadets to use its photographic laboratory facilities. On December 24, 1917 the first photographic cadets, about fifth in number, reported to the Commandant

of the United States Army School of Military Aeronautics, and the School of Aerial Photography continued in operation from that time until after the closing of the School of Military Aeronautics. At first the Photographic Cadets were quartered in the same barracks as the Flying Cadets but as this was not a satisfactory arrangement they were removed later to new quarters in Schoelkopf Hall.

At times the number of Photographic Cadets exceeded two hundred. Originally the school gave elementary instruction in photography but later was made an advanced school in photographic interpretation.

The next revision of the curriculum for the School of Military Aeronautics was dated March 1, 1918 and increased the course to twelve weeks. This fifty per cent increase in time devoted to ground school instruction became desirable now because the ground schools had been turning out graduates faster than the flying schools could train them, and also because experience had shown that this additional time was needed to do the essential work.

"The keynote of the longer course is to be the inculcation of discipline and a proper military ideal in the Flying Cadets," said the Memorandum explaining the change. The idea was not so much to increase quantitatively the subjects taught as to insure a greater thoroughness in those already being given. The course provided for frequent periods of supervised recreation and sports. Wednesday afternoons and Saturday mornings were set aside for this

purpose. The class entering March 11, 1917, started on the twelve week course.

The classes had hardly started on the curriculum of March 1, 1917, when another revision dated April 1, 1917, was received. The Memorandum accompanying it stated, "In accordance with instructions received from the Chief of the Training Section on March 15, the following subjects are given in the Flying Schools, Military Subjects seventy-one hours, Airplanes thirty-six hours, Engines twenty-nine hours, Artillery Observation Range sixteen hours, total one hundred fifty-two hours, are to be taken wherever possible by the Ground Schools, leaving to the Flying Schools only practical work with such necessary periodic qualification tests as will insure the cadets' proficiency. The total increase over the curriculum of November 1, 1917, was one hundred twenty-eight hours. To allow for the increase in Airplanes and Engines, the courses in Pursuit, Bombing, Co-operation with Infantry, Reconnaissance and Photography were omitted. It was intended to cover these subjects in general lectures from time to time.

Discussion continued on Page 72

CURRICULUM FOR THE U.S. SCHOOLS OF MILITARY AERONAUTICS
 Revised March 1, 1918.

40

12 weeks course.

	T	1	2	3	4	5	6	7	8	9	10	11	12	T
<u>(1) Military Sub.</u>														
Practical*	135	22½	22½	18½	18½	12½	7½	7½	7½	7½	7½	7½	7½	
Theoretical	40	6	4	3	3	3	3	3	3	3	3	3	3	
Weekly Inspection	12	1	1	1	1	1	1	1	1	1	1	1	1	
Examination	3	-	-	-	1	-	-	-	-	-	-	-	2	190

(2) SIGNALLING

Practical	40	5	5	3	3	3	3	3	3	3	3	3	3	
Radio Apparatus	2	-	-	-	-	-	2	-	-	-	-	-	-	
Examination	2	-	-	-	1	-	-	-	-	-	-	-	1	44

(3) GUNNERY

Practical	50	-	-	4	5	5	6	4	5	5	6	5	5	
Examination	2	-	-	-	-	-	1	-	-	-	-	-	1	52

(4) AIRPLANES

Theory of Flight	6	-	2	2	1	1	-	-	-	-	-	-	-	
Meteorology	3	-	-	1	1	1	-	-	-	-	-	-	-	
Rigging	22	2	2	4	4	4	2	2	-	-	-	2	-	
Repair of Machines	8	-	-	-	-	-	-	2	2	-	2	2	-	
Instruments	4	-	-	-	-	-	-	2	2	-	-	-	-	
Types of Machines	2	-	-	-	-	-	-	2	-	-	-	-	-	
Examination	2	-	-	-	-	-	-	-	-	-	-	2	-	47

(5) Engines

Principles	8	-	-	2	2	2	2	-	-	-	-	-	-	
Laboratory	42	-	-	4	2	4	8	6	6	-	2	2	8	
Care of Engines	2	-	-	-	-	-	1	1	-	-	-	-	-	
Types of Engines	1	-	-	-	-	-	-	1	-	-	-	-	-	
Examination	2	-	-	-	-	-	-	-	-	-	-	-	2	55

(6) AERIAL TACTICS

Pursuit	1	-	-	-	-	-	-	1	-	-	-	-	-	
Bombing	2	-	-	-	-	-	-	1	1	-	-	-	-	
Reconnaissance	2	-	-	-	-	-	-	-	1	-	1	-	-	
Coop. Infantry	1	-	-	-	-	-	-	-	-	-	1	-	-	
Map Reading	14	-	-	-	-	-	-	2	4	2	4	2	-	
Coop. Artillery	4	-	-	-	-	-	-	-	-	4	-	-	-	
Artillery Obs. Range	14	-	-	-	-	-	-	-	6	-	6	2	-	
Photography	6	-	-	-	-	-	-	-	2	2	-	2	-	
Examination	2	-	-	-	-	-	-	-	-	-	-	2	-	46
TOTALS	434	36½	36½	36½	36½	36½	36½	36½	36½	36½	36½	36½	36½	434

(7) Supervised Recreation and Organized Sports--2 hrs. daily, including (1) Inter-squadron contests in football, soccer, basketball, track athletics, or hockey, according to season. (2) Informal Sports: track athletics, tennis, boxing, wrestling, fencing, gymnastics, rowing, swimming, etc., according to season and facilities. (3) Trap shooting, or target practice with rifle or pistol.

*One-half hour each day devoted to Ceremonies such as Guard Mount, Parade, Review, Retreat, etc. Each cadet to perform at least one complete tour of guard duty. Calisthenics at least one-half hour, preferably in the morning, taken from the drill period.

CURRICULUM FOR THE U.S. SCHOOLS OF MILITARY AERONAUTICS
Revised April 1, 1918.

Subjects	T	1	2	3	4	5	6	7	8	9	10	11	12	T
(1) MILITARY SUBS.														
Practical*	135	42	17	10	10	10	10	10	10	10	10	7 1/2	7 1/2	
Theoretical	41	6	4	4	4	4	4	4	4	4	3	-	-	
Inspection	12	1	1	1	1	1	1	1	1	1	1	1	1	
Examination	2	-	-	-	-	-	-	-	-	-	2	-	-	190
(2) SIGNALLING														
Practical	39	5	4	3	3	3	3	3	3	3	3	3	3	
Radio Apparatus	2	-	-	-	-	-	2	-	-	-	-	-	-	
Examination	2	-	-	-	-	-	-	-	-	-	-	-	2	45
(3) GUNNERY														
Practical	50	-	-	4	5	5	6	4	5	5	6	5	5	
Examination	2	-	-	-	-	-	-	-	-	-	-	-	2	52
(4) AIRPLANES														
Theory of Flight	6	-	2	2	1	1	-	-	-	-	-	-	-	
Meteorology	3	-	-	1	1	1	-	-	-	-	-	-	-	
Rigging	26	2	4	6	4	6	2	2	-	-	-	-	-	
Repair of Machines	12	-	-	-	-	-	-	2	4	2	2	2	-	
Instruments	4	-	-	-	-	-	2	2	-	-	-	-	-	
Types of Machines	2	-	-	-	-	-	-	2	-	-	-	-	-	
Examination	2	-	-	-	-	-	-	-	-	-	-	2	-	55
(5) ENGINES														
Principles	9	-	2	2	2	1	-	2	-	-	-	-	-	
Types of Engines	2	-	-	-	-	1	1	-	-	-	-	-	-	
Laboratory	46	-	2	4	6	4	6	4	3	4	-	6	4	
Examination	2	-	-	-	-	-	-	-	-	-	-	-	2	59
(6) OBSERVATION														
Map Reading	16	-	-	-	-	-	-	-	4	4	2	4	2	
Coop. Artillery	5	-	-	-	-	-	-	-	-	3	2	-	-	
Artillery Obs. Range	16	-	-	-	-	-	-	-	-	-	6	6	4	
Examination	2	-	-	-	-	-	-	-	-	-	-	-	2	39
<hr/>														
	438	36 1/2	36 1/2	37	37	37	37	36	37	38	37	56 1/2	34 1/2	438

(7) Supervised Recreation and Organized Sports - 5 hours a week, including (1) Inter-squadron contests in football, soccer, basketball, baseball, track athletics or hockey, according to season; (2) Informal sports: track athletics, tennis, boxing, wrestling, fencing, gymnastics, rowing, swimming, etc., according to season and facilities; (3) Trap shooting, or target practice with rifle or pistol.

*One-half hour each day devoted to Ceremonies such as Guard Mount, Parade, Review, Retreat, etc. Each cadet to perform at least one complete tour of guard duty. Calisthenics at least one-half hour, preferably in the morning, taken from the drill period.

SYLLABUS FOR MILITARY SUBJECTS IN UNITED STATES SCHOOLS OF MILITARY AERONAUTICS.

April 1, 1918.

1. MILITARY SUBJECTS	190 hours.
1. <u>Practical Course</u>	135 hours.

a. Daily Infantry Drill through the School of the Company, Ceremonies and Guard Duty.

The purpose of this is primarily disciplinary but also aims to give that knowledge of the drill regulations which every officer should have to enable him to take command of a small body of troops or to participate in ceremonial formations. The first ten days, drill should be under the personal supervision of the most competent officer available. After the first ten days, every cadet should be given frequent opportunity to command a squadron at drill and his performance should be carefully noted and marked by a competent officer. A great deal of attention should be paid to the ceremonial side of military life. One-half hour each day should be devoted to ceremonies such as Formal Guard Mount, Parade, Retreat, etc. Each squadron in turn should hold a formal guard mount, witnessed by the other squadrons, and each cadet should have at least one complete tour of guard duty.

Each cadet should be taught the Manual of Arms provided the necessary arms are available. As there will probably not be sufficient for the entire command, this should be taught to men individually or in Squad when they enter the School. Arms will be used in guard duty, if available. As the supply of arms will be greatly limited the Commandants will have to use their best judgment in apportioning the time for instruction.

b. Physical Training.

This training should be sufficient to keep the men in good physical condition and should also be treated as a disciplinary exercise. There should be a period of calisthenics of one-half hour each day, preferably before noon. This exercise should be most carefully supervised. It is even more important for purposes of discipline than as physical exercise. The student officers of the School should not be depended upon to conduct these exercises. Either an officer or a non-commissioned officer should conduct them. The work of individual cadets should be carefully noted with respect to their spirit and efficiency. (Use and follow carefully Manual of Physical Training, U.S.Army.)

c. First Aid.

There should be enough first aid drill or demonstration to give the cadet a fair amount of efficiency in the practical application of the matters covered in the lectures on Military Hygiene: e.g., bandaging, applying splints, etc.

Not more than four of the hours set aside for drill should be devoted to this, the remaining time being taken from the study hours, the amount to be optional with the Commandants. Cadet officers who show proficiency in this work may be utilized in instructing others. It is suggested that this instruction be given in small groups, under the direction of the Medical Officer.

2. Theoretical Course

41 hours.

a. Military Discipline and Esprit de Corps 1 hr.

References: U.S. Army Regulations, Article 1; Manual of Military Training (Moss), Paragraphs 12, 13, 910-916; Officers' Manual, (Moss), Chapters XXII and XXIII; A Manual for Courts-Martial, par. 333; Infantry Drill Regulations, U.S. Army, par.6; An Officer's Notes (Parker), Chapter II, p.49; The Plattsburg Manual (Ellis and Garey), pp.17, 216; Fundamentals of Military Service (Andrews), Chapters II, III, and V. The reasons for discipline and the results of the lack of it are matters of the highest importance. In the Air Service, its importance should be continually reiterated throughout the course.

It must be remembered that the Schools are not training "aerial chauffeurs" or "exhibition flyers" but officers of the army on whose sound judgment and mental alertness lives of thousands of men will depend. Military aviators should be men of the highest character, well educated and of good physique. Emphasize the fact that the course of study is intended to be very difficult and a test of unusual ability. This and the following lecture should be given by the Commandant.

b. Military Courtesy and Ideals of the Service. 1 hr.

References: Army Regulations, Article 1, par. IV and Article XL will be the basis for this lecture; Officers' Manual (Moss), Chapter II; see also references for preceding lecture. It is considered of the utmost importance that at the beginning of his course a student should gain not only a thorough knowledge of discipline but also a facility in its outward expression, as exemplified by the observance of prescribed military "courtesy" and conduct. Matters such as "mess etiquette" should be gone into. Every R.M.A. is expected to be both an "officer" and a "gentleman".

c. Manual of Interior Guard Duty

2 Hrs.

This course will be the foundation for the practical work in Guard Duty as outlined in 1 (a)

d. Administration of the United States Army 1 Hr.

References: U.S. Army Regulations, Articles LVII, LVIII, LIX, LXVII, LXVIII, LXXVIII, LXXIV, LXXVI, LXXVII; National Defense Act of June 3, 1916, Sections 1, 5-17, 81; Staff Manual of United States Army.

The duties and powers of President, Secretary of War, Chief of Staff and various Staff departments.

e. Organization of the United States Army 2 Hrs.

References: National Defense Act of June 3, 1916; Tables of Organization, January, 1918; Stencil 135. For the Air Service, Stencils 649A, 969.

These two hours should be devoted to the division of the army into various branches, including the Air Service, and the composition of the different units of these branches.

f. Military Hygiene and Sanitation 3 Hrs.

References: Elements of Military Hygiene (Ashburn); Moss' Manual of Military Training, Part V, Chapters I, II, and III; Fundamentals of Military Service (Andrews) Chapter XXIV; What a Soldier Should Know (Bolles, Jones, etc.) Chapter X, First Aid; and especially Lectures on Military Sanitation and Management of Sanitary Service--Army Service Schools.

This course is to include: 1. Personal Hygiene, including orthopedic instruction; 2. Military Sanitation and Management of Sanitary Service; and 3. First Aid--wounds of soft parts, fractures, poisons, asphyxia, and other emergencies. This course is to be given by the Medical Officer.

g. Paper Work 10 Hrs.

References: Army Paper Work (Moss); Company Administration (Waldron); Forms furnished by A.G.O.; Engineer Training Manual, Appendix No. 2; Army Paper Work Pamphlet - Perrin-Smith Printing Co., Saint Louis; Company Administration (Grievies).

Instructions should be given in the following: Morning Report, Daily Sick Report, Duty Roster, Muster Roll, Officers' Pay Voucher and Mileage Voucher, Ration Return, Company Return, Discharges, Certificate of Disability, Service Record, Final Statement, Survey Report, Inventory and Inspection Report, Individual Equipment Record, Correspondence. Great stress should be laid on correspondence. The cadet should have constant drill in the actual use of the forms. This can be done by conferences in which forms are distributed to be filled out or to be corrected by the cadets. For this purpose each school should supply itself with large quantities of the forms mentioned. This will probably have to be done by mimeographed copies as the actual forms cannot be procured in large quantities from the A.G.O.

Engineer Training Manual, Appendix No. 2 should be used as basis for the work.

h. Army Regulations

7 Hrs.

References: A.R.II,III,IV(Pars.13,14,16,), V, VIII, IX (49,50,51,52, 54, 55, 56, 57, 63, 64), X, XI, XII, XIII (83), XVII, XVIII (14), XIX (116, 117, 118, 120, 129, 130, 131,132), XX, XXI, XXII, XXIII, XXVIII, (215), XXX (270-277, 283-295, 296,327, 379-392 1/2, 406, 407), LII, LIII (657-670, 693), LV (825, 846-877), LXXIII (1024, 1025, 1036, 1044, 1050, 1057, 1062, 1110-1134,1146-1178, 1184, 1187, 1202-1223,1256, 1269, 1275, 1276, 1279, 1280).

These references should be divided into two broad divisions - one treating of the enlisted man, the other of the officer. Article XXVIII should be read. In dealing with the sections of Army Regulations covering the general subject of Practical Company Administration, the scope of the work should go beyond the Army Regulations in matters of organizing, equipping, clothing, and messing and should also take up the matter of prescribed uniforms, clothing and equipment both in this country and for foreign service. The subject of Responsibility and Accountability in the drawing of equipment should be stressed. For this the best reference is "Quartermaster and Ordnance Supply" (University of Chicago Press) Chapter III. For uniform regulations - Special Regulations No. 42, Stencil #494. Bulletin No. 2, Jan. 25, 1918, War Department. Table of Fundamental allowances of Quartermaster Supplies (1917).

i. Military Law

6 Hrs.

References: Articles of War, A Manual for Courts-Martial, especially Chapters I-XI; Military Law (Davis); Military Law and Procedure (Winthrop); U.S. Army Regulations, pars. 922-942; Digest of Opinions of the Judge Advocate General.

This should include an indication of the material that should be studied, a study of the Articles of War, Manual for Courts-Martial, and a brief study of the relation of Civil and Military Law including Rights and Obligations of soldiers. The instruction in this course be by means of conferences and practical problems solved during the conferences and the solutions discussed. There should be a practical illustration of the workings of a general court-martial.

j. Methods of Modern Warfare

7 Hrs.

1. An outline of the methods used by the armies of today in combat, covering extended order, trench warfare and modes of attack now in use on European battle fronts. Care should be taken to correlate this course on general methods with the course in Observation which is devoted especially to the duties of the Air Service. A brief outline

of the organization of the British, French, and German armies may also be included. The basis for this course will be Colonel Paul Azan's "War of Positions" and the following War College Publications already sent to the Schools:

1. Notes on Recent Operations No. 1 and No. 2.
2. Notes on Employment of Artillery in Trench Fighting.
3. Instructions on the Offensive Conduct of Small Units.
4. Notes on the Methods of Attack and Defense to meet conditions of modern warfare.
5. Liaison Instructions for All Arms.
6. Notes on Grenade Warfare.
7. Notes on the use of Machine Guns in trench warfare.

4 hours.

2. Gas Defense.

The material for this course will be found in the following Army War College Publications.

- (1) Memorandum on Gas Poisoning in Warfare with notes on the pathology and treatment.
- (2) Gas Warfare.
Part I. German Methods of Offense.
Part II. Methods of Defense Against Gas Attacks.
Part III. Methods of Training in Defensive Measures.

These three hours are to be devoted to lectures on the Use of Gas in Warfare - The Cloud Gas Attack, Gas Shells, Kinds of Gases used and effects, General Precautionary Measures, First Aid. This theoretical work will be supplemented by four or five hours in drill, (taken from the practical course in Infantry Drill) with the gas mask as outlined in Gas Warfare, Part III. Since the cadets in the Ground Schools are to be officer, their instruction should be such that in emergencies they could instruct recruits or civilians. 3 Hrs.

k. Morale

1 Hr.

References: Fundamentals of Military Service (Andrews) pp. 10-11, 35-36, 44, 79-80, and references in (a) and (b).

This lecture should be given towards the end of the course. Emphasis on the supreme importance of the Air Service.

l. Weekly Inspection

12 Hrs.

m. Examination

2 Hrs.

Explain fully that the candidate may be discharged at any time during his course of training by reason of failure to pass tests or examinations, by giving evidence to his commanding officer that he is unfitted either mentally, morally, or physically for the duties of a flying officer, or for any other reason which shall in the opinion of the examining board, and

subject to such approval as is necessary, unless his services no longer desired. The actual mental and physical requirements for a flying officer are so great, his ability to do several things at once and do them all accurately is so essential, that discharge is not necessarily any reflection on the man's character, loyalty or devotion to duty. There is room only for the very best.

The references given under each course are simply suggestive and not to be regarded as exhaustive. The method of instruction in these courses should not be confined to lectures. There should be a combination of recitations, conferences, and lectures. In Army Paper Work, Army Regulations, and Military Law, the instruction should be almost exclusively by means of recitations, conferences, and practical problems. Further references will be supplied from time to time.

Stencil No 157.

WILLIAMSON AIR SQUADRON
IN
UNITED STATES SCHOOL OF MILITARY AERONAUTICS,
April 1, 1916.

II. Signalling

45 hours.

1. The course in Practical Signalling will occupy 39 hours, about 33 of which are to be devoted to Buzzer Work, 3 hours to Lamp Signalling, and 3 hours to the Panneau. In addition to this, 2 lectures on the Use of Radio Apparatus are to be given, and a further 2 hours allotted to the examination. No field work is required and no lectures on Theory of Radio.

2. The whole aim of the teaching should concentrate on the practical training necessary for efficient signalling from an airplane; every phase of telegraphy not essential for pilots should be strictly eliminated. (For type of signals used see Stencil #294 pp. 22-25, 31-32.)

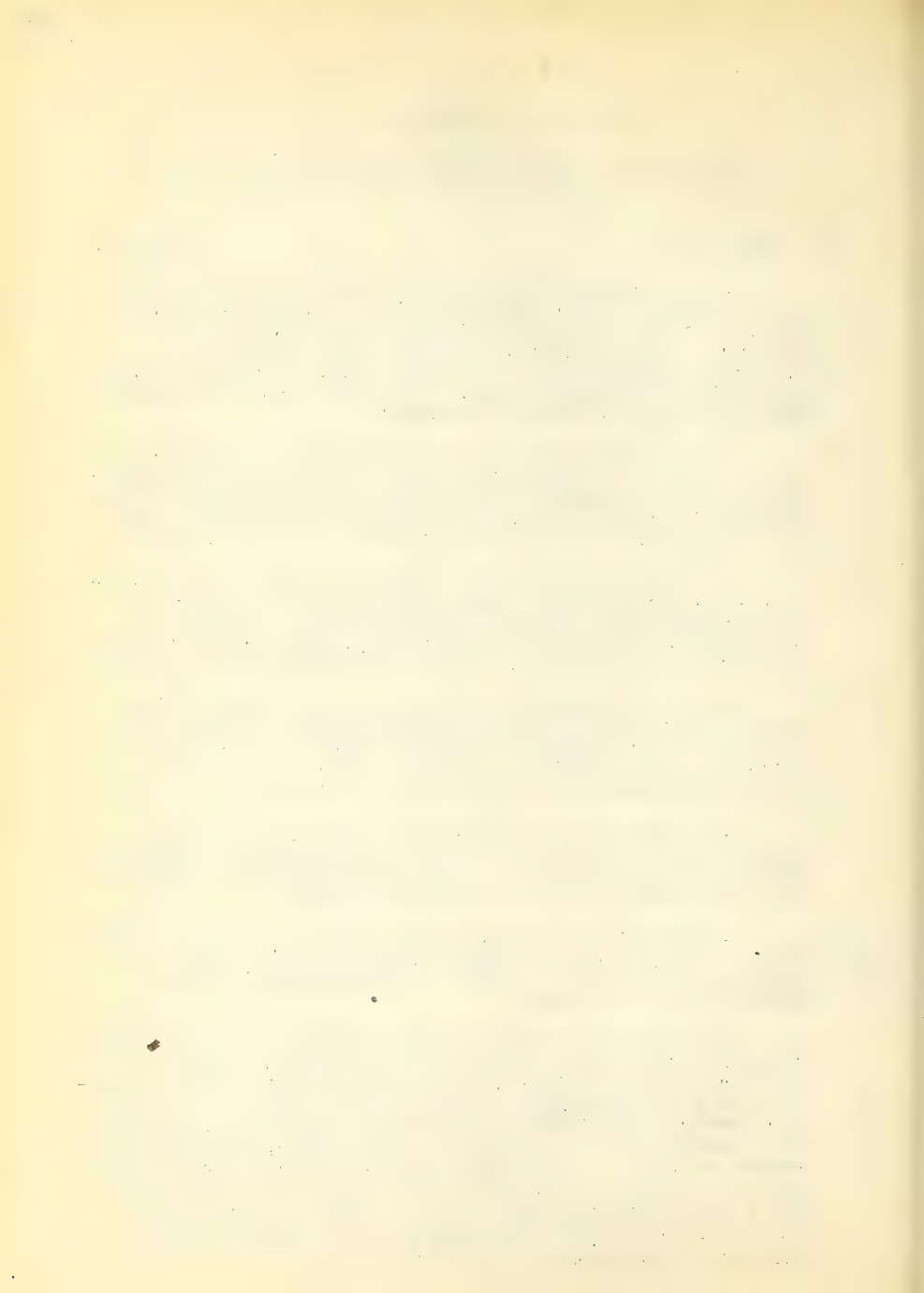
3. This means that the emphasis of the course is to be upon accuracy rather than upon speed, since for airplane signalling a moderate speed is quite sufficient but accuracy is absolutely necessary, not only as regards the letters and figures, but also the spacing of groups.

4. It is important that at first the instruction should be entirely from the sound and not the sight of the code. Nothing printed or written should be used until the cadet is fairly familiar with the sound groups. It is a training of the ear that is desired.

5. Later in the course work with the silenced key should be stressed for the sake of training the touch independent of the ear. In signalling from an airplane the pilot has to rely on touch altogether.

6. Men above average proficiency are not to be held back. One group in a class may be working at better speed than the rest. Men of previous experience may be used to send to others.

7. The fast division of each Squadron will be given "passing out" tests at the end of each week at the rate of ten words per minute, the other requirements for passing the final examination remaining the same. A cadet who "passes out" passes the course provided he attends the classes in visual signalling and radio, and practices buzzer as required at least fifteen minutes each day. He will be tested in this practice at the end of each week, and a record of the tests will be kept. If the record shows that his work is falling off, more than fifteen minutes practice may be required.



8. Opportunity will be given to groups of two or more students to practice buzzer work by themselves, if they care to, in any free time.

9. Outline of Work:

a. Morse code taught by ear. Alphabet, including "oh" (- - -), numerals, symbols for "break" (-...-), for correction (.....), and for end of message (-.-.). No other symbols needed. Common mistakes in forming letters. Spacing of words. Proper method of holding key, position of arm and wrist. (See Stencil 584 "ARTILLERY COORDINATION COURSE No. 7"; also Bulletin 198.)

b. Practice in sending and receiving with buzzer and Morse Recorder at least a half hour every day. Two or three days of plain English. All of the rest of the work in code. Letters and figures interspersed. Spacing of groups to be emphasized. Cadet will be taught to write all messages in block (printed capital) letters. Zero is to be distinguished from the letter O by a dot in the center (0); figure 1 will be written with a short upstroke (1) to distinguish it from the letter l.

c. During the 12 weeks' course cadets are to develop their practice in both sending and receiving to at least 10 and not more than 12 words per minute, though this ruling need not apply to cadets who have "passed out". It is a good plan several times in the course suddenly to increase the speed of receiving for a short period to keep the men alert, and to give them a standard by which to judge their own development; e.g., jump from 5 words a minute to 8, for part of an hour, and then go back to 5 or 6.

d. Work with the Lamp and the Miniature Panneau should not begin until the seventh week, when men have attained considerable proficiency with the buzzer. A total of 6 hours is to be devoted to visual signalling. At first, single letters to be received and written down; then, groups of three or more symbols. Requirement 4 words a minute. (For description of panneau see Bulletin No. 27 (Oct. 11) and Photograph #140.)

e. Two lectures on Use of Radio Apparatus in the sixth week. Parts and connections of apparatus in the sixth week. Parts and connections of apparatus. Importance of directional sending. Safety plug. Winding out and in of aerial. (See Stencil No. 580, pp. 5 ff. and "S.S.131", pp. 38-43.)

10. Final Examination.

a. Receiving: Each cadet receives buzzer code for two minutes at the rate of 8 words a minute, 5 letters to a word. A minute's practice, not counted, may precede the test. Men who receive 6 symbols wrong are graded at the passing mark, 60%. More than 6 wrong count as failure.

b. Sending: Morse Recorder used. Men to be given list of signals in code. Signals spaced and divided into groups, with figures in different color from letters, as an aid to following with the eye. A minute's practice not counted may precede the test. Each man sends for two minutes at the rate of 8 words a minute, 5 letters to a word. Each letter of the alphabet and each figure to occur at least once on the examination. A cadet making more than 5 mistakes fails.

c. In both sending and receiving tests intervals should occur irregularly and not uniformly at the end of five symbols. An interval omitted or misplaced should count as an error.

d. There is to be no examination on visual signaling or on the radio lectures.

SYLLABUS FOR GUNNERY IN ALL UNITED STATES
SCHOOLS OF MILITARY AERONAUTICS.

April 1, 1918

111. GUNNERY

Subjects of Instruction

The course in Gunnery at the United States Schools of Military Aeronautics will be conducted upon the basis of this syllabus and upon the instructional notes issued by the Department of Gunnery, as follows:

1. Lewis Gun: 2. Marlin Gun: 3. Ring Sights.

The time allotted by subjects is as follows:

1. Lewis Gun: Time allotted.

- | | |
|---|----------|
| (a) General description. | 2 hours. |
| (b) Mechanism (Notes to be given in full from stencil) | 5 " |
| (c) Stripping | 3 " |
| (d) Drill | 3 " |
| (e) Stoppages and immediate action. (Indoor Work) | 3 " |
| (f) Care and cleaning (Notes to be given in full from stencil) | 3 " |
| (g) Aiming. (To be carefully explained and thoroughly understood) | 1 " |
| (h) Points before and after firing on range | 2 " |
| (i) Testing magazines, ammunition, etc. | 2 " |

2. Marlin Gun:

- | | |
|---|-----|
| (a) General description | 2 " |
| (b) Mechanism | 3 " |
| (c) Stripping | 3 " |
| (d) Drill (Loading and unloading) | 2 " |
| (e) Stoppages and immediate action. | 3 " |
| (f) Care and cleaning | 2 " |
| (g) Points before and after firing on range | 3 " |

3. Ring Sights as per Stencil: 2 "

Review, Lewis Gun 5 "

Review, Marlin Gun 5 "

Examination 2 "

52 hours.

The time allotted by weeks is as follows:

	T	1	2	3	4	5	6	7	8	9	10	11	12	T
Practical	50	-	-	4	5	5	6	4	5	5	6	5	5	
Examination	2	-	-	-	-	-	-	-	-	-	-	-	2	52

There will be no instruction in Gunnery during the first two weeks. The third, fourth, fifth and sixth weeks will be devoted to instruction on the Lewis gun. The seventh, eighth, ninth and tenth weeks will be devoted to instruction on the Marlin gun. The eleventh week will be given to review work upon the Lewis gun and the twelfth week to review work upon the Marlin gun. During the twelfth week a final examination will be given.

The character of the review work of the eleventh and twelfth weeks will be determined by the instructors in the Department of Gunnery, who will adapt their instruction to the individual needs of the cadets in the subject.

As soon as possible, instruction in synchronizing gears will be introduced in the U. S. Schools of Military Aeronautics. This instruction will occur in the eleventh and twelfth weeks and will partly or wholly take the place of the two weeks review work on the Lewis and Marlin guns.

SYLLABUS FOR COURSE IN AIRPLANES
UNITED STATES SCHOOLS OF MILITARY AERONAUTICS.

April 1, 1918

55 hours.

IV. AIRPLANES

GENERAL REFERENCES: Signal Corps Training Manual Part I, Aviation Section of the Signal Corps; Training Manual of the Royal Flying Corps, Vol. I; Air Service Handbook (Lt. Col. L. W. B. Rees), in course of publication.

1. Types of Machines.

References: Notes on the Identification of Aeroplanes; Silhouettes d'Avions; Brief Technical Description of Various Airplanes (Stencil 876).

The object of this course is (1) to give detailed instruction on a few machines which are to be used by the American Expeditionary Force (see Bulletin No. 173 for all Schools); (2) to familiarize the cadets with the general characteristics of French, British and German machines. To aid in accomplishing the latter purpose, part of the second hour should be spent on a test, using silhouette cards of a few of the most important types. (See Bulletins 100 and 110)

2. Theory of Flight.

References: The Aeroplane Speaks (H. Barber); Aviation (Algeron C. Berriman); Aerial Navigation (Albert Zahm); Learning to Fly in the U. S. Army (E. N. Pales); The Eyes of the Army and Navy (Albert H. Munday); Acquiring Wings (William B. Stout).

More technical, for instructors: First Annual Report of the National Advisory Committee for Aeronautics, pp 25-110; Second Annual Report of the foregoing, pp 13-14, 555-627; Military Aeroplanes and Monoplanes and Biplanes (Grover . Loening); The Mechanics of the Aeroplane (Capt. Duchene, translated by J. H. Ledeboer); The Aeroplane (A. Page); The Design of Aeroplanes (A.W. Judge); Aerodynamics and Aerodromics (F. W. Langhester); Course in Aerodynamics and Airplane Design (Alexander Klemm and T. H. Huff, published August 1916-August 1917 in "Aviation").

Instructors are also advised to familiarize themselves with the following works, which constitute the most accessible printed "sources" of knowledge on the subject:

S. P. Langley, "Experiments in Aerodynamics",
Smithsonian Institution,

- 1891, and "Researches and Experiments in Aerial Navigation", Gov't. Printing Office, 1908.
- Otto Lilienthal, "Birdflight as the Basis of Aviation", translated by A. W. Isenthal. Longmans Green, 1911
- A. G. Eiffel, "The Resistance of the Air, and other Experiments Conducted at the Champs de Mars Laboratory", translated by Jerome C. Hunsaker. Houghton Mifflin, 1913.
- Octave Chanute, "Progress in Flying Machines", M. L. Forney, N. Y., 1908, and "Recent Progress in Aviation", Annual Smithsonian Report, 1910.
- Wilbur Wright, "Experiments and Observations in Soaring Flight" 1903

Clear, untechnical instruction on the cardinal principles and conditions of flight. As has been previously stated, especial emphasis should be laid on the various kinds of stability and the methods used for obtaining them, in order to give the cadet confidence in his machine. Formulae and mathematics will be avoided. Under these restrictions, instructors will follow their own methods in teaching the subject. Below is a list of the chief points to be covered:

1. Primary forces - lift, drift, gravity, thrust.
2. Secondary factors - incidence, camber, stagger, streamline, aspect ratio, etc.
3. Conditions necessary for flight; for speed; for climb.
4. Balancing of forces; gliding angle, flying angles, etc.
5. Lift-drift ratio, and the factors affecting it.
6. Stability; various kinds and how secured.
7. Control.

Nomenclature:

This subject will not be taught separately, as heretofore, but in connection with Rigging and Theory of Flight. For the parts of the airplane a labelled machine should be used. Instructors will make it their object to teach things rather than names, so that mention of them will bring to the cadet's mind a whole chain of purposes and interrelations and not merely a barren verbal definition. For further guidance on this subject consult Bulletin for all schools, No. 144.

History of Flying.

Instruction on this subject will be limited to one hour and will have as its object the tracing of the development of the airplane of today. The significance of each step may be most clearly explained by some such method as a black-board sketch of a contemporary machine with the authors of

the various features marked on it; e.g., "Camber, Lilienthal"; "Biplane truss, Chanute"; "Stabilizing devices, the Wright Brothers"; "Fuselage, Bleriot and Nieuport". A few minutes may be devoted to the development of balloons.

3. Rigging

References: The Aeroplane Speaks, pp. 90-114; Notes on Rigging for Air Mechanics (entire); Manuscript Lecture Notes, S. M. A. (entire); Training Manual Royal Flying Corps, Vol. 1; Military Aeroplanes (G. C. Leaning), pp. 121-138; method of Aligning the Curtiss JN4B.

PRACTICAL

Introduction (first week)

Nomenclature and construction of an airplane. Functions of the various parts; of controls. Class gathered round a labelled machine. Brief outline of the content and purpose of Rigging; its importance to pilots. At this time it may be well to give a few general instructions on the use of tools; which to use and not to use for certain purposes; e. g. pliers on turnbuckles. Further instruction on tools to be given when their uses are considered.

Assembly and Alignment

A few hours should be devoted to practice on assembly and disassembly of wings center section, empennage and landing gear, in order to get the order firmly in mind. When this has been done, practice on alignment may begin. This should include alignment of the landing gear, fuselage, tail surfaces, center section and control surfaces; setting and checking lateral dihedral, stagger, incidence, wash-in and wash-out; over all measurements; "vetting". Every cadet should assist in making all these alignments at least once, and if circumstances permit, several times. Special attention to be given to the alignment of wings and control surfaces.

LECTURES

Alignment

Its importance in field work; necessity of pilot being able to detect faulty rigging and correct it. Effects on flight of the most common faults in alignment; why a machine flies one wing low, nose-heavy, tail-heavy, etc.

Materials and Stresses.

Woods; different varieties used in airplane construction;

comparative strength-weight ratios of various woods. Comparison with metals, showing why wood and not metal is chiefly used in airplane construction. Factors affecting the desirability of woods for various parts; grain, seasoning, position in tree. Metals; steel, aluminum, copper. Brief outline of the different kinds of steel; importance of getting the right kind for various purposes. Stresses; tension, compression, torsion, bending, shearing; where found in an airplane. Factors of safety of various members.

Wires and Fittings.

Kinds of wire; solid wire, aircraft strand, aircraft cord; qualities and uses of each; comparative strength. Streamline wire. Fittings, turnbuckles, locking devices. Brief description of terminal splines (practical work under Care and Repair of Machines); comparative efficiency.

Propellers

Explanation of pitch, pitch angle, slip (as untechnical as possible). Why two-blade propellers are best for light motors, four blade ones on large motors. Construction and nomenclature. Use of balancing ways and checking table.

Fabric and Dopes.

Qualifications of an ideal fabric; of those actually used, linen and cotton. Strength and lightness. Process of covering. Purposes of dope; explanation of nitrate and acetate dopes; methods of application; inflammability. Use of varnish.

The lectures should be distributed through the practical work, in the order above given. The lecture on alignment should serve as an introduction to practical work in that subject. So far as possible the course will be divided into two - hour periods, in order to avoid interruption of a task before completion.

4. Care and Repair of Machines.

References: Training Manual Royal Flying Corps, Vol. I, pp. 10-17; Signal Corps Training Manual Part I, Chap. III; Manuscript Lecture Notes; Inspection Manual, Signal Corps, U. S. A.

Inspection

This part of the course will consist of actual inspection of an airplane, exclusive of the power plant, by the cadet, using the inspection forms. Instructors will explain in detail what constitutes cause for rejection, especially in wires and in the faulty grain of wooden members.

Care of Machines (lectures)

1 hour.

Directions for packing and unpacking; loading on trucks, and unloading. Rules for daily care of airplanes and hangars. Methods of inspection; parts subject to daily and weekly inspection.

Patching, Mending and Doping.

3 hours

Actual practice in mending tears and applying patches to fabric. Practice in the application of dope and varnish. If time allows, cadets may cover a small surface such as an aileron or rudder, sewing cloth at open end and around ribs.

Splicing and Soldering.

4 hours

Explanation of how to make French, American running and eye splices; relative efficiency, laboratory work; each cadet will make a loop of some sort. Soldering; advantages; brazing, welding, hard and soft soldering processes. Purpose and use of fluxes. Things to be avoided; over-heating, grease, air bubbles, etc. Demonstration of some soldering process, complete, by the instructor, and if possible actual practice by the cadets. If they have made American or running splices, they may complete the job by soldering.

Mending Longerons, etc.

2 hours

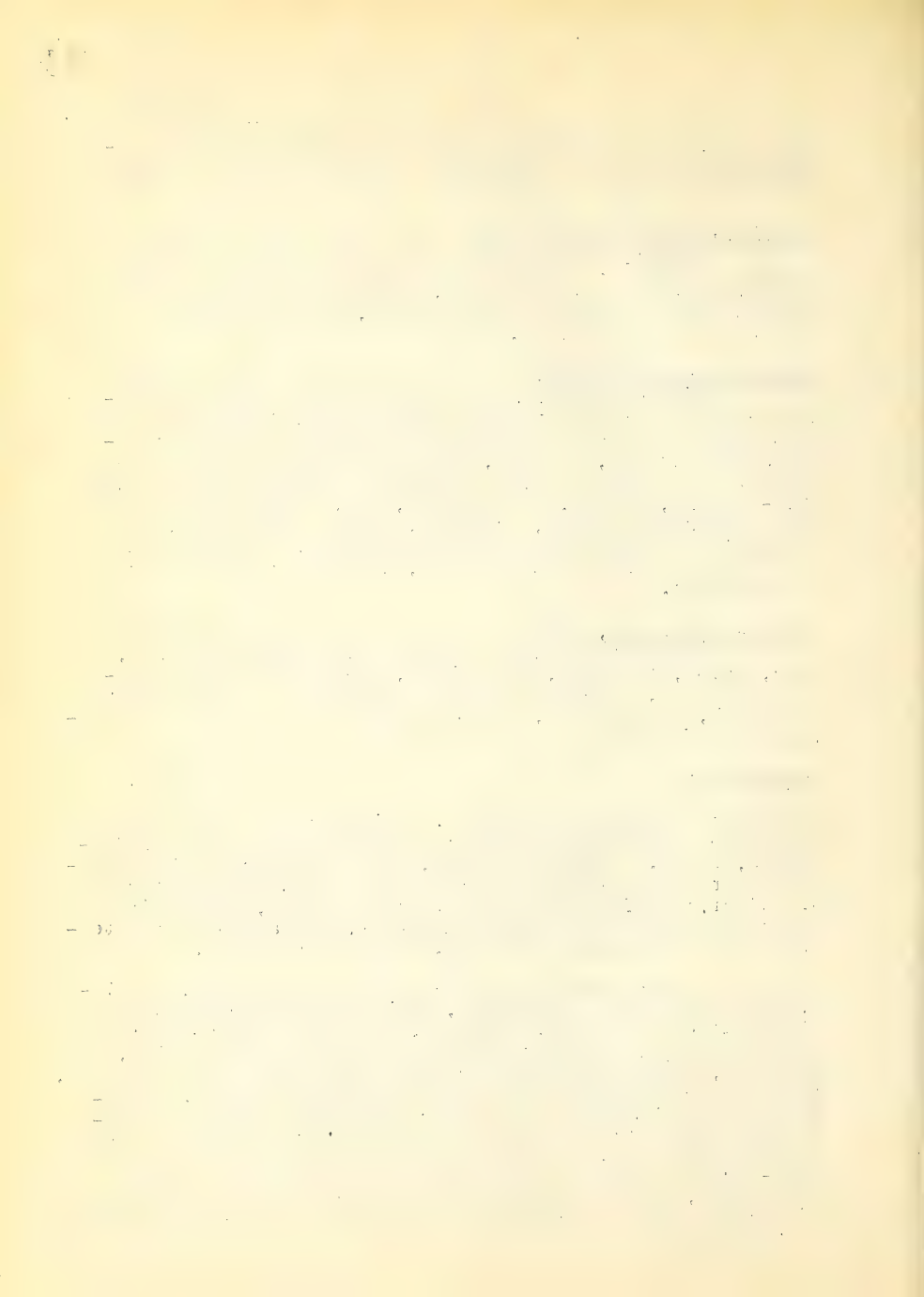
Method of mending a longeron, cutting of joint, glue, bolts, wrapping, varnishing, practical work if possible; if not, demonstration by instructor. How to mend a rib web, a cap strip, how to repair the leading and trailing edge of a wing.

5. Meteorology

3 hours

References: Meteorology (W. I. Milham); The Principles of Aerography (Alexander Meadie); Holes in the Air (W. F. Humphreys, Gov't. Printing Office, 1913); Charts of the Atmosphere for Aeronauts and Aviators (A. L. Rothh and Andrew H. Palmer); Aerial Navigation (Albert Zahn), Part III; The Aviator and the Weather Bureau (T. A. Carpenter); Meteorology and War Flying (R. DeG. Ward) Stencil 552.

A brief outline of elementary meteorology, as simple and practical as possible, with the main emphasis on its relation to flying. Matters which are essential to an understanding of the subject but have no direct bearing, on aviation, such as planetary winds or the mercurial barometer, will be explained with the utmost possible brevity. Especial care should be taken to prevent the cadets from receiving false impressions concerning "holes in the air" and kindred phenomena. It should be explained that to the modern high-powered machine these present little danger or even difficulty, and the proper course of action in each event should be given. Following is an outline of the main points to be covered:



of meteorological knowledge to

December 21, 1918.

From: The Commandant.

To: Director of Military Aeronautics, Training Section, Ground
Schools Branch, Washington, D. C.

Subject: History of the United States Army School of Military Aeronautics,
Cornell University, Ithaca, N.Y.

2. In compliance with your Memorandum No. 348 for all schools, dated November 13, 1918, a copy of "History of the United States Army School of Military Aeronautics at Cornell University, Ithaca, N.Y., May 1917 to December, 1918" compiled by 1st Lieut. Charles B. Benson, Air Service, (Aeronautics), is being forwarded under separate cover to your office.

George E. Harrison,
Lt. Colonel, A. S. (A).

1911, 1912, 1913

the Government

Director of Military Training
Military Training, War Department

History of the United States Army School of Military
General University, Kansas, Mo.

...with the ...
...of the ...
...of the ...
...of the ...

1911, 1912, 1913

1. The importance of meteorological knowledge to aviators. Weather forecasting; action under various conditions.
2. Causes of climate; the sun, the rotation of the earth, the temperatures, pressure areas and winds.
3. Pressure, the keynote of weather. Methods of measuring; relation to cyclonic and anti-cyclonic systems; application to everyday weather.
4. The atmosphere: properties of upper as distinguished from surface air. Temperature and wind gradients. All common phenomena - cascades, fountains, other convectional currents; layers; waves; influence of surface irregularities.
5. Clouds: Kinds, heights, meanings. Thunderstorms.
6. Weather forecasting: Government maps, American, British, French. Untechnical rules of thumb. Interpretation from the ground of conditions at altitudes.

6. Instruments and Compasses

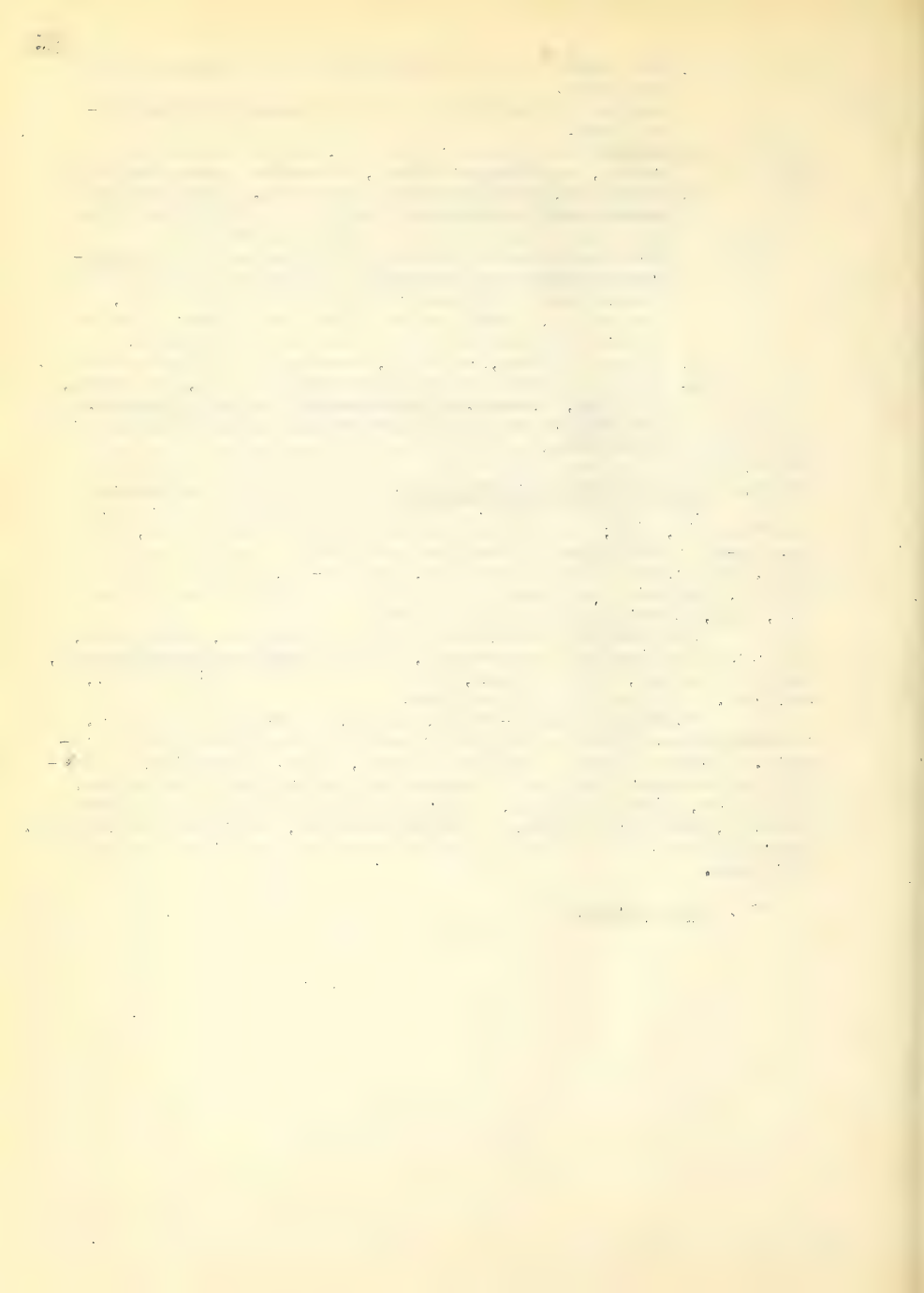
4 hours.

References: Signal Corps Training Manual Part I. Chapters VI, VII; Training Manual Royal Flying Corps, Vol. I pp. 80-100; The Eyes of the Army and Navy (A. H. Munday) Chap. X; General Specifications, pp. 25-28, Second Annual Report, National Advisory Committee for Aeronautics; Stennils 565, 662, Manuscript Lecture Notes.

Purpose and mechanism of the altimeter, barograph, air speed indicator, tachometer, oil and gas pressure gauges, gasoline gauge, drift meter, inclinometer; methods of use, setting. Errors and corrections.

Compass: Gimbal-swung, nautical and aerial types. Explanation of true north and causes of variation and deviation. Rubber line. Deviation card, uses. Examples of converting compass bearing to magnetic bearing and vice versa. Variation, plus or minus, and conversion of true to magnetic bearing, and vice versa. Course setting, with wind allowance. Brief explanation of adjusting compass to deviation in an airplane.

7. Examination



SYLLABUS FOR COURSE IN ENGINES IN
UNITED STATES SCHOOL OF MILITARY
AERONAUTICS.
April ., 1918

59 hours.

V. ENGINES.

Introduction.

The course in Engines will occupy 59 hours, of which 11 are given to lectures, 46 are spent in the laboratory, and 2 are reserved for an examination. When possible laboratory period should be two hours in length to avoid interruption in the performance of a definite piece of work.

The aim of the theoretical work will be able to establish fundamental principles, (1) so that a cadet will understand the parts of his engine in their working relation with especial view to the prevention of trouble, and (2) so that a cadet changing from one motor to another will not be confronted with something wholly new but rather with something familiar in essentials and new only in certain details.

The

The aim of the laboratory work will be first, to give clearer meaning to the lectures since the engine parts referred to are seen and handled and put in relation by the cadets themselves, and second, to give a cadet the technical skill required by practical problems in the field.

General References:

Signal Corps Training Manual Part I. (Aviation
Section, Signal Corps)
Airplane Motors - Geo. E. A. Hallett.
Aviation Engines - Captain Victor W. Page.
Chart for Location of Airplane Power Plant Troubles -
Captain Victor W. Page
Dyke's Encyclopedia
Mechanical Engineers' Handbook
American Machinist's Handbook.

Special References:

Instruction books of various manufacturers

PRINCIPLES - 9 hours.

1. Engine Action (Stationary Engine)

Power - velocity - R.P.M. - source of power - heat - pressure - transmission of power - piston - connecting rod - wrist pin - crank pin (throw) - crank web - crank shaft - intake and exhaust valves - location of valves.

Four Stroke Cycle

1. Intake stroke - position of valves - suction - charge - intake manifold.
2. Compression stroke - position of valves - compression - low compression - piston rings - cast iron - heat - pre-ignition.
3. Power stroke - position of valves - combustion chamber - heat loss - back - kick - misfiring - exhaust valve lead.
4. Exhaust stroke - position of valves - heat loss - back firing.

Valve Timing - (1) meaning; (2) purpose; (3) method; check by (1) crankshaft disc; (2) piston travel.

Multi-cylinder engine - working strokes - smooth torque - arrangement of cylinders (1) vertical; (2) Vee; - Firing order.

Cam - cam shaft - cam follower - tappet rod - rocker arm - gears - gaskets - bushings - bearings - bearing clearance shims - thrust bearings.

II. Carburetion.

Gasoline - gas - requirements of a good carburetor - principle of single jet carburetor - float feed - Venturi tube choke valve - throttle - mixing chamber - rich mixture - lean mixture - difficulties in use of single jet carburetor - auxiliary air valve - Zenith carburetor - main jet - compensating jet - priming tube - well - principle of Claudel carburetor.

Effect of altitude on carburetion.

III Ignition

Electricity - voltage - current - resistance - magnetism. Units of electricity - ampere - ohm - volt - watt. Lines of force - conductor - electrical impulse.

Magneto

Rotating armature - alternating current. High tension magneto - primary circuit - primary winding - collector ring - interrupter - short circuit - switch - ground - condenser. Secondary circuit - secondary winding - induced current - safety gap - distributor - spark plug - electrode - air gap - two spark ignition - timing the magneto (1) meaning; (2) purpose; (3) method. Sequence of firing. Advancing the spark - retarding the spark - when used.

Complete instruction on Barling and Dixie magneto (or equivalent).

Complete instruction on Deco Battery Ignition.

IV. Lubrication

Importance of lubrication. Oil film - fluid friction. Requirements of lubricant - body, fluidity - conductor of heat, etc. Must not vaporize from heat or coagulate or leave injurious deposits, etc.

Kinds of lubricant - petroleum - castor oil - carbon deposits.

Pumps (plunger)(gear). Gauge - pressure relief valve - filter screen - sump - reclamation.

Systems of lubrication (force feed, full force feed).

V. Cooling

Water cooling - radiator - water jacket - pump (gear, centrifugal) - Thermo-syphon principle. Anti-freezing mixtures.

Air cooling - advantages and disadvantages.

VI. Inspection and Trouble Shooting.

Causes of noisy action - misfiring - overheating - loss of power - failure to start - failure to stop - failure to throttle down - back firing. Logical search for trouble - general troubles - local troubles.

TYPES OF ENGINES - 2 hours.

Gnome Monosoupape

1 hour.

Rotary engines - arrangement of cylinders - crankshaft center - crank pin center - rotation of cylinders - rotation of pistons - transmission of power - length of stroke - odd number of cylinders - firing order - cycle of operations - carburetion - valves and cams - timing of valves and magneto - lubrication - cooling - materials - advantages and disadvantages.

Hispano Suiza

1 hour.

According to Instruction Book.

LABORATORY - 46 hours.

I. Assembly

Assembling and disassembling two motors, with attention to valve timing, clearances, lubrication system, cooling system, materials and specifications of each. Careful alignment of parts. Instruction in tools in connections with their use.

II. RepairCooling System - 2 hours.

Soldering cracked water jacket, soldering radiator, testing for leaks, water pump repairs. Repairs of pipes and connections. Have each cadet take pump apart.

Oiling System - 2 hours.

Explain setting oil pressure relief valve, removing and cleaning oil filter screen, taking down oil pump, cleaning oil pipes with compressed air, examination of pump for indication of bearing condition, tests of oil; have cadets do all work mentioned.

Carburetion System - 2 hours.

Have all cadets take down Zenith carburetor, remove and clean jets, set float level and adjust carburetor on motor. Show cadets how to make good pipe joints, solder leaky tank, etc.

Ignition System - 2 hours.

Each cadet should take a magneto apart completely, reassemble and test. Each cadet should be given instruction on cleaning and adjusting spark plugs, making wire terminals, adjusting magneto breaker points, cleaning distributor replacing brushes, etc.

Cylinders - 2 hours

Each cadet should be made to clean carbon out of combustion chamber, solder water jacket on Curtiss engine, clean and ream valve seats and show how to detect worn or scored cylinders, worn guides, etc.

Valves - 2 hours.

Cadets should be taught how to remove valves, clean off stems, grind in for shoulders, warped heads, scored or pitted seats. Each cadet should grind in two valves to good seating and test seating with prussian blue. Importance of using proper abrasive and grinding pressure should be emphasized.

Pistons - 2 hours.

Each cadet should be made to clean off carbon and polish piston with mineral wood in and out after rings are removed. Outline importance of cleaning spaces back of rings, having proper elasticity to rings and not too much side play in grooves. Show method of removing and installing rings without breaking. Have cadet fit oversized ring to groove. Explain necessary gap at ring for expansion.

Bearings - 6 hours.

Connecting Rod Bearings - Explain to each cadet how bearing linings wear in service. Have each cadet remove worn lining and replace with new brasses. Show method of lining with reamer and fixture, and method of fitting by scraping. Show tests for bearing parallelism and proper bearing.

Main Bearing Fitting - Show cadet how bearings are aligned with line reamer and fitted with hand scraping process.

Work by cadets on connecting rod bearing scraping. Show how to test, with blue, sharpen scraper on oil stone and emphasize care to be taken. Each cadet should have an opportunity to handle bearing scraper.

Work by cadets in fitting crankcase main bearings by hand scraping and alignment bar. Use discarded crankcase and straight shaft.

Crankshaft - 2 hours.

Each cadet should be taught how to swing crankshaft in lathe and test for true and roundness of crankpins and main journals with dial indicator. Roughened bearings should be smoothed down with lap or emery paper and oil. All points on crankshaft needing inspection should be pointed out.

III. Trouble Shooting.

Cadets must be able to locate and correct faults in carburetion and ignition systems of motor on test block, set oil pressure relief valve, find cause of overheating, etc.

A motor should be assembled with various faults such as one piston without **wings**, loose bearing, poor valves in one cylinder, imperfect valve timing, loose pins in rocker arms, etc., and installed on test stand. Cadets should be made to find and correct troubles and have engine running quietly, smoothly and at proper number of R. P. M. with standard propeller or brake installed.

Examination

2 hours.

Syllabus for Course in Observation in United States Schools of Military Aeronautics.

April 1, 1918

39 hours.

VI. OBSERVATION

1. Map Reading

References: Military Map Reading (Capt. C. O. Sherrill); Notes on Training Field Artillery Details (Danford & Moretti) pp. 1-20; Instructions Concerning Battle Maps - Annexes (W.D. Document No. 598) pp. 42-43; Maps and Artillery Boards (W. D. Document No. 567).

The aim of this course is to give the cadet such map knowledge as will enable him to visualize the area represented with reference both to the relief and the natural and artificial features upon the surface, to the end that he may be able, first, to find his way about over the territory, and second, to locate and describe points of military importance. It is of primary importance that an aviator should not get lost. This point is so obvious that it is apt to be neglected, but it should be kept in mind continually throughout the course. Since little sketching is required of an aviator, practice in map sketching will be given only for the purpose of assisting the student in map interpretation. The main part of the work in pinpointing is to be done on the Artillery Observation Range. The practice on the rotary map is intended to correct for the confusing effect of the rotary motion experienced in turning about with the airplane at great heights. As to accuracy required, see suggestions under Artillery Observation Range and make proper allowance for difference in scale.

One hour is to be devoted to each of the following paragraphs:

I. Importance of map knowledge to a military aviator, kinds of maps used in military operations, conventional signs and abbreviations, meaning of scales and method of representation, scales of French and English maps, problems in reading ground distances in metric units by use of scales. (The meter and kilometer must become familiar units of measure. The meter stick should be handled by the students. One hundred meters, then one kilometer should be measured off on a straight road or street familiar to the students in order to fix these values in their minds. Practice in estimating distances should be given when out of doors.)

II. Contours, vertical or contour interval (V. I.), map distance (M.D.), guides in making and reading contour maps

profiles, exercises in sketching contours with reference to hills, valleys, saddles, cliffs, gentle and rugged slopes, etc. Review conventional signs and abbreviations. Review scales.

III. Orientation: definition, orientation by stars, by watch, by known points, and by compass; true north and magnetic north, azimuth, problems on variation and deviation. Finding one's position on the map; resection; intersection. Sketching equipment.

IV. French and English systems of squaring maps explained. Pinpointing demonstrated and practiced on hand maps.

V. Problems on scales, converting French scales into English and vice versa; determining scale from points of known distance; converting R. F. into scale of inches per mile or miles per inch, etc.

VI. Problems in plotting courses having given distances and bearings, and problems in finding distances and bearings having the course defined by points to be covered.

VII & VIII. Photographic interpretation. Lectures with slides.

IX. Pin pointing on rotary map.

X. Designate two points on floor map, then by use of hand map calculate distance and true or magnetic bearing. Distance should be computed in metric units.

XI. Give the cadet the bearing and length of a course starting from a given point on the floor map. Require the finishing point of the flight.

XII. Plot a course covering three, four, or five points marked on floor map. Require the cadets to compute the distances and bearings of each part of course.

XIII. The airplane is assumed to be flying along a course designated on the floor map. At a certain point along the course it is decided the pilot will turn towards the airdrome. Require how many degrees the machine will turn to fly in new direction and distance to airdrome from point of turning.

XIV to XVI. inc. Working Scales and sketching out of doors. The out-door sketching may precede the work on the rotary map at the discretion of the instructor.

2. Cooperation with Artillery.

References for Cooperation with Artillery and Artillery Observation Range; Field Artillery Notes No. 1; Instructions for the Employment of Aerial Observation in Liaison with Artillery (Stencil 294; identical with Chapter VII of the foregoing); Notes on Training Field Artillery Details (Danford and Moretti); Duties of the Air Service (Stencil 827); French Artillery Observation (Stencil 841); Artillery Notes for Observers (Stencil 765); French Artillery and Air Organization (Stencil 828); Instructional Notes No. 20; Use of artillery in Battle (Stencil 895); Spacemen Shoot, Instructional Notes No. 25; French Artillery zone and battle maps.

I. Types of Artillery. Field guns, light howitzers; long range guns, heavy howitzers, trench mortars; calibres and uses of each type. Stencil 765, Instructional Notes No. 20). Types of ammunition; high explosives, shrapnel and high explosive shrapnel. Types of burst, graze, etc. Barrage, counter battery, siege.

II. Organization of French artillery; allotment of front. Organization of Flying Corps (French Artillery and Air Organization, French Artillery Observation, artillery zone maps. 1;50000).

III. Methods of Fire. (F. A. Notes No. 1, Chap. III.) Fire for adjustment, fire for effect; destruction, neutralization. Prearranged and impromptu shoots, zone maps. (French Artillery Observation)

IV. Methods of Fire, continued. Explanation of range, deflection, bracket, salvo, bracketing salvo, center of impact, causes of error, sheaf of fire, 50. zone, 100. zone, time of flight. Reporting of observations. (Signal Cards.).

V. Procedure of a shoot. (French Artillery Observation). What to do before, during and after a shoot, reports. Outline of different methods of procedure in cooperation with heavy and light artillery. (Stencil 294)

3 Artillery Observation Range.

16 hours

I. Explanation of range and French Kilometer grid. Use coordinates.

1 hour

II. Preliminary practice in pin-pointing, oral or written; all the class observing.

III. Reporting of points (bursts) by buzzer. Half class may act as observers and half as wireless officers, the latter receiving the reports of the former, writing them down and handing them in to the instructor. Class changes places every half hour. If this is impossible, some other arrangements may be made, with the purpose always in view of giving every man the longest possible time at the key.

2 hours.

IV. Explanation of French system of corrections with reference to the battery-target line. Rough methods of judging distances on the range. Practice with single shots in reference to a target; same system as before, single bursts.

2 hours

V. Conduct of prearranged and impromptu shoots, with ground strips. (There is in the French system no "Zone Call" in the English sense, as the observer takes up with him a map showing districts covered by light and heavy batteries, with approximate position of the latter.) All firing by single bursts.

2 hours.

VI. Further practice in procedure, with single shots.

VII. Explanation of salvo fire; speed of shots, time of flight; system of judging with reference to the right gun of the hostile battery; deflection error taken from right hand burst of salvo, range from mean point of impact. Practice in shoots, as before.

VIII. Further practice in salvo fire. Review. 2 hours

IX. Examination (To be given in twelfth week).

5 pin-points, 5 corrections on the BT line, single shots, by buzzer.

Part of a prearranged shoot (single shots mainly or wholly) with ground strips; at least 5 corrections.

X. System of grading. The final mark on the whole course will be computed as follows:

50% on written examination, covering Map Reading and Cooperation with Artillery.

50% on artillery observation range work.

The marks on range work will be computed as follows:

50% on examination.

50% on class work, based on grades for three short tests of recitations, by buzzer, of a minimum of five pinpoint or corrections each.

The passing mark will be 60. Allowable margin of error, 5 centimeters (2 inches) on the range, or 50 meters on the ground, in both directions. (It is assumed that the

range is on a scale of 1:1000 and that the observer's gallery is approximately 15 feet above it; margin may be altered at discretion of instructor to meet other conditions.)

Any class work given in the courses covered by the written examination will not be included in the final grade.

(Note. The above apportionment of time to subject matter will be followed as closely as possible, but instructors are at liberty to alter details of instruction to suit the exigencies of the ranges. As will be seen from the material sent out, the work of this course does not cover the whole ground. The instruction will be continued at the Flying Schools.)

Examination in Map Reading and Cooperation with Artillery
2 hours

April 1, 1918

5 hours a week.

VII. SUPERVISED RECREATION AND ORGANIZED SPORTS

Time for recreation is provided in the afternoon, early or late according to season. It will include the following:

1. Inter-squadron contests in football, baseball, soccer, basketball, track athletics or hockey, according to season.
2. Informal sports: track athletics, gymnastics, tennis, boxing, wrestling, fencing, rowing swimming, etc. according to season and facilities.
3. Trap shooting, or target practice with the Army rifle or pistol.

The object is to provide:

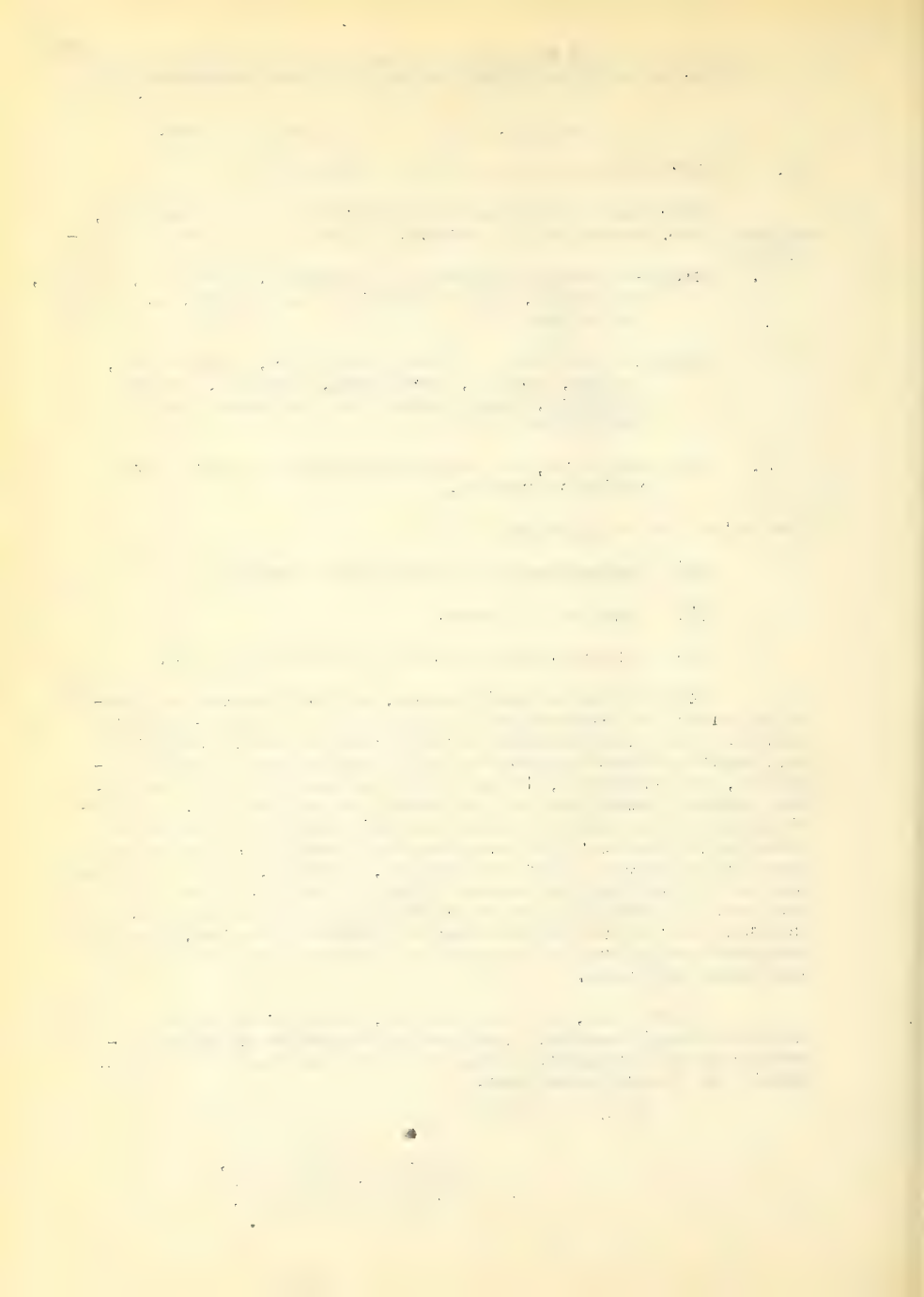
- (a) Recreation from more formal duties.
- (b) Physical fitness.
- (c) A more lively sense of esprit de corps.

For the last-named reason, as many cadets as possible should be encouraged to take part in inter-squadron sports. The Schools will furnish the necessary athletic equipment and the Commandant will appoint an athletic director, or committee, to make the necessary arrangements. The cadets themselves may be consulted on details. Championship series may be organized and trophies offered to the winning teams with the object of inspiring the greatest possible interest. Due precaution, however, should be taken against diverting the cadets' chief attention from their studies. It should also be made plain to them that the time devoted to recreation is a part of the curriculum, and is included in it for the purpose of making them better and healthier officers.

Cadets may, if they choose, be allowed to participate in less formal sports, in which tournaments of team contests may be arranged. Trap shooting and target practice should be freely developed.

By direction of the Chief Signal Officer:

Geo. A. Washington,
Captain, Signal Corps.
O. I. C. Schools Branch,
Training Section.



	1917	1918	1919
First Call	5:00	5:00	7:00
Reveille	6:05	6:05	7:05
Assembly	6:10	6:10	7:10
Mess	6:35	6:35	7:25
Assembly	6:40	6:40	7:30
Stodt	7:00	7:00	9:00
Simphon			9:00
Patience	7:10	7:10	
Drill	7:30	7:30	
Assembly	7:35	7:35	
Recall	7:55		
1st Sergeants		7:45	
School	7:55		
Assembly	8:00		
School	8:55		
Assembly	9:00		
School	9:55		
Assembly	10:00		
School	10:55		
Assembly	11:00		
Recall	12:00	12:00	
Mess	12:15	12:15	12:25
Assembly	12:20	12:20	12:30
School	1:25		
Assembly	1:30		
School	2:25		
Assembly	2:30		
Recall	2:30		
Drill	2:35		
Assembly	2:40		
1st. Sergeants	2:40		
Guard Mounting	2:40	3:40	3:40
Adjutant's Call	2:45	3:45	3:45
Recall	5:20		
Adjutant's Call (for retreat)	5:30		
Adjutant's Call	5:35		
Mess	5:55	5:55	5:55
Assembly	6:00	6:00	6:00
School	6:25		6:25
Assembly	6:30		6:30
Tattoo	9:30	10:30	9:30
Call to Quarters	9:40	10:40	9:40
Days	10:00	11:00	10:00

On April 11, the Commandant was given authority to put into effect the curriculum of April 1, for squadrons working in the curriculum of base 1. This was accomplished without difficulty.

In order to have a class graduate each week, so that there would not be a gap between the time the last class on the eight weeks course and the first class on the twelve weeks course graduated, the classes were divided up according to scholarship. Of the classes of April 11, the first third was graduated on April 27, the second third on May 4, and the last third on May 11. Of the class of June 1, the first third in scholarship was graduated on May 18, without final examination, the second third May 25, and the last third on June 1. Special schedules for the irregular cadets were arranged by the Commandant.

From time to time memoranda were received making slight changes in arrangements and in instructional material, but in general there was little change until the final curriculum dated October 24, 1918. This curriculum provided for instruction of Bombers, Pilots, and Observers in separate groups after the fourth week. Until that time the three groups received the same instruction. Under the new

consideration the "M" had a total of eight weeks, the
Covers were nine, and the Dilator twelve. They were separated
at the end of the fourth week according to confidential
instructions received from Washington.

The class entering October 21, started on this
curriculum.

Discussion continued on Page 107

74

CURRICULUM FOR THE U. S. SCHOOLS OF MILITARY AERONAUTICS

Course for Pilots.

Revised October 14, 1919.

SUBJECT	T	1	2	3	4	5	6	7	8	9	10	11	12	2
I. MILITARY SUBJECTS														
Drills	132	29	10	10	10	10	10	10	10	10	10	8	5	
Theoretical	29	5	11	5		5	3							
Examinations	3		(2)				(1)							
Gas Defense	8					4	4							
Examination	1						(1)							173
II. SIMULATIONS														
Practical	25	5	10	5			3	2						
Radio Apparatus	2										2			
Examination	2			(1)							(1)			29
III. GUNNERY														
Machine Guns	50								10	7½	7½	12½	12½	
Traps	10								2½	2½	2½	2½	2½	
Examination	5												(2)	62
IV. AIRPLANES														
Principles, Theory of Flight	6				4	2								
Rigging	25				4	6	6	6	3					
Instructions	2				2									
Types	2					2								
Engine	12											6	6	
Examination	5					(1)		(2)						61
V. ENGINES														
Principles	12				4	4	4							
Types	4							2	2					
Shopwork	52				5	6	6	5	7	3				
Engines Running	18									8	10			
Examination	3					(1)				(2)				66
VI. OBSERVATION														
Maps	18		8	6	4									
Examination	1				(1)									
Navigation	15							10	5					
Meteorology	8								2					
Examination	1								(1)					
in Nav. & Meteo														
Coop. Art'l -	5									4	1			
Lecture - Range	4										4			
Photo. Interpretation	19											10	8	
												(2)		66
<hr/>														
	39	39	39	39	39	38	38	37	37	37	39	38		480

CURRICULUM FOR THE U. S. SCHOOLS OF MILITARY

AERONAUTICS

Course for Bombers.

Revised, Oct. 14, 1918.

SUBJECT	T	1	2	3	4	5	6	7	8	Totals
I. MILITARY SUBJECTS										
Drills*	99	29	10	10	10	10	10	10	10	
Theoretical	29	5	11	5		5	5			
Examination	3			(2)			(1)			
Gas Defense	8					4	4			
Examination	1						(1)			140
II. SIGNALING										
Practical	30	5	10	5		5		5		
Radio - Apparatus	2								2	
Examination	2			(1)					(1)	34
III. GUNNERY										
Machine Guns.	30					5	10	7½	7½	
Traps	5							2½	2½	
Examination	2								(2)	37
IV. AIRPLANES										
Principles	6			4	2					
Rigging	10			4	6					
Repair	3				3					
Instruments	2			2						
Types	2				2					24
Examination	1				(1)					
V. ENGINES										
Principles	4				4					
Shop Work	5				5					
Examination	1				(1)					10
VI. OBSERVATION										
Maps	10		8	3	4					
Examination	1				(1)					
Navigation	15					10	5			
Examination	1						(1)			
Photo, Interpretation	18							10	8	
Examination	2								(2)	
Bombing	9						3	4	2	
Examination.	1								(1)	55
<hr/>										
	99	59	39	39	39	39	38	59	38	310

Subject	T	1	2	3	4	5	6	7	8	9	E
I. MILITARY SUBORDS											
Drills	109	29	10	10	10	10	10	10	10	10	
Theoretical	39	6	11	5		5	3				
Examination	3		(2)				(1)				
Gas Defense	8					4	4				
Examination	1						(1)				150
II. SIGNALING											
Practical	30	5	10	5		5		5			
Radio- Apparatus	2									2	
Examination	2			(1)						(1)	34
III. MOUNTAIN											
Machine Guns	30					5	10	1½	7½		
Traps	10							2½	3½		
Examination	2							(2)			22
IV. AIRCRAFTS											
Principles	4			4		2					
Misings	10			1		5					
Repair.	3					2					
Instruments	2			2							
Types	2					2					
Examination	1					(1)					20
V. ENGINES											
Principles	4					4					
Shop Work	5					5					
Examination	1					(1)					10
VI. OBSERVATION											
Maps.	18		8	6		4					
Examination	1					(1)					
Navigation	15						10		5		
Examination	1								(1)		
Coop. Art'l - Lectures	5								1		
& Range	4								4		
Examination	1								(1)		
Photo. Interpretation	38								5	15	17
Examination	2									(1)	85
				39	21	39	38	30	37	37	345

77
85

VII. Supervised Recreation and Sports - Three and one-half (3 1/2) hours Wednesday afternoon - Contests football, soccer, basketball, track, etc., - Two (2) hours Saturday mornings, boxing, wrestling, gymnastic and bayonet fencing.

VIII. Saturday afternoons and evenings and Sundays, until 7:00 P. M., release from quarters.

Twenty (20) minutes Calisthenics immediately after reveille, daily except Saturdays, Sundays and holidays.
Mondays, Tuesdays, Thursdays, and Fridays, -- Desert to Colors, Parade,

Review of Formal Guard Mount.

Saturday mornings, -- Formal inspection preceded by Review.

NOTE

The curriculum herein contained is to be adhered to literally in the following respects:

1. Time allotted to each subject.
2. Division of time by weeks.
3. Subject matter.

It is believed that the details of the curriculum as outlined present a successful solution of the teaching administration of the various subjects, both as to analysis, and as to the order in which the subdivisions of the subjects are introduced, and that the assignment of time to the subdivisions is reasonable and practicable. It is realized, however, that discretion must be allowed to the individual instructors, under the supervision of the heads of departments, to revise the curriculum as there suggested so far as these details are concerned, if in their opinion such revision is required to obtain the best results in teaching.

The field of military aeronautics is developing so fast that it is not easy for any individual or institution to keep abreast of it. The instructional staffs of the schools must therefore make every effort, by means of the bulletins sent out by the Ground Schools Branch, by reading the latest publications, by conversation with practical aviators at every opportunity, to keep their knowledge up to date. If at any time they thus obtain new material for their courses it will be to the advantage of all concerned. No serious change in any course must be made, however, without authority from the Training Section, Ground Schools Branch.

SYLLABUS FOR COURSE IN MILITARY SUBJECTS IN
UNITED STATE SCHOOLS OF MILITARY ADMINISTRATION.
Revised October 14, 1918

I. MILITARY SUBJECTS

140-175 hours.

1. Practical course.

a. Daily infantry drill, including the Schools of the Soldier, Squad and Company, Ceremonies and Guard Duty.

While the purpose of this drill is primarily disciplinary, every cadet should be given sufficient training to enable him to take command of a small body of troops or to participate in ceremonial formations. To this end every cadet should be given frequent opportunity to command a squadron at drill and his performance should be carefully noted and marked by a competent officer. All cadets should be taught the Manual of Arms. One half an hour on Mondays Tuesdays, Thursdays and Fridays should be devoted to ceremonies, such as Parade, Review, Retreat and Formal Guard Mount. On Saturday mornings there will be Formal Inspection, preceded by Review. Cadets should be thoroughly instructed in Interior Guard Duty; each cadet should perform actual guard duty several times during his course. The hours allotted to drill are intended to include the time necessary for instruction in Infantry Drill Regulations and Interior Guard Duty by the tactical officers.

b. Physical Training.

A twenty minute period should be devoted immediately after reveille, daily except Saturdays, Sundays and Holidays, to Calisthenics. This exercise should be most carefully supervised, as it is to be regarded, aside from the physical exercise which it affords, as an important disciplinary exercise. The content of this work should not be left to the student officers; it should be carried on by an officer or a non-commissioned officer.

c. First Aid.

Not more than three hours should be devoted to demonstration and drill in first aid measures under the supervision of the medical officer, and in accordance with lectures given on the subject.

Throughout the work outlined above, the work of the individual cadets is to be carefully noted with respect to their spirit and efficiency.

3. Theoretical Course - Lectures. 25 hours.
(For references see Stencil no. 157)
- a. Discipline, Military Courtesy, Ideals of the Service. 1 hour

Every effort should be made to make this lecture inspiring and impressive. It should be the first lecture of the course and, when possible, should be given by the Commandant. It is of the utmost importance that the vital necessity of discipline should be impressed upon the cadet at the beginning of his course. The intimate relation between military courtesy and discipline should be stressed. It should also be made very clear to the cadets that they are expected to become flying officers and not mere aerial chauffeurs. It cannot be too strongly impressed upon the cadets that they must conform to the standards of "an officer and a gentleman."

- b. Hygiene and Sanitation. 3 hours

This course should include: (1) Personal Hygiene; (2) First Aid; (3) Sanitation in Barracks and Camps. These lectures will be given in the fifth or sixth week.

- c. Organization of the United States Army. 1 hour

This lecture should be a general survey of the administrative organization of the army, including the relations of the President, Secretary of War, and Chief of Staff, and the functions of the various staff corps and departments. The general administrative organization of the Air Service should be especially emphasized. No attempt should be made to teach details.

- d. Methods of Modern Warfare. 7 hours.

An outline should be given of the methods used by the armies of today on the European battle fronts, covering modes of attack and defense, including trench warfare. The special point to be brought out is the place of the airplane in modern military operations. The various types of air service -- scout, observation, artillery co-operations, infantry co-operation, bombing, combat and independent -- should be described in connection with these various operations. It will be noted that the time given to this subject has been increased from four to seven hours and the course should be made correspondingly more serious. These lectures will be given before the two-hour examination

- e. Army Regulations and Paper Work. 12 hours.

The aim of this instruction should not be to compel the cadet to memorize detailed points in "Army Regulations" or the details of Army Paper Work. The instructor should not follow the text of "Army Regulations" but should cover the topics as such, pointing out where the regulations are to be found. Matters covered in "Special Regulations" or "General Orders" should not be slighted. As at the end of the course the cadet should have mastered the fundamental rules as to authorities, procedure, pay and allowances, etc., in the army, and know where to look for the rest. The subjects of rank and grade and uniform and insignia may well be taken up first. These should be followed by regulations primarily affecting enlisted men, such as promotions, transfer, furloughs, discharges, desertion, pay and allowances and compulsory allotments. Then should come regulations affecting officers such as commissions, promotions, transfers, leaves, of absence, travel, pay and allowances, resignation and dismissal. Accountability and responsibility should be explained thoroughly. Essential points in squadron administration, such as squadron funds and mess funds, should also be taken up.

In the study of paper work only the most essential forms, such as are used daily or frequently in connection with squadron administration, should be discussed. The following should be covered: Service Record, Individual Equipment Record, Morning Report, Sick Report, Duty Roster, Ration Return, Discharge Certificate, Final Statement, Delinquency Record, Memorandum Receipt, Report of Survey and Statement of Charges. It is not intended that there shall be any hard and fast line drawn between hours devoted to Army Regulations and those devoted to Paper Work. The best results can be obtained by merging the treatment of the two at times. It is expected that printed forms shall be distributed among the cadets to be filled in by them, and that these forms shall be corrected and given back to the cadets. Each cadet should have a copy of the Engineer Training Manual Appendix No. 2, in his possession throughout the course in Paper Work. As much time as possible should be devoted to the subject of Military Correspondence. The cadet should be required to write at least two letters, with indorsements; these should be corrected and returned.

Examination.

A two period written examination will be given at the end of the third week, following 21 hours of instruction. This examination will be final on the subjects covered in the first three weeks.

- f. Military Law. 4 hours.

This course should cover the essentials of Military Law, including types of jurisdiction and tribunals, persons subject to military law, relations between civil and military courts, reciprocal rights and duties of officers and enlisted men, preferring of charges, appointment and jurisdiction of courts-martial and court procedure, with especial reference to the rights of the accused. The Manual of Courts-Martial should be brought to attention as a reference book only. The expenditure of a relatively large proportion of the time on general court-martial procedure should be avoided.

g. Morale and Esprit de Corps. 1 hour

This lecture, like the first, should be delivered by the Commandant. It should come near the end of the course and should emphasize the importance of the Air Service in itself, and of high ideals and morale in this Service. The cadets should draw from it an inspiration which they will carry with them to their own great good and the good of the Service into flying field, camp, and actual service at the front.

Examination. 1 hour

This examination will be final on the subjects covered in the fifth and sixth weeks.

3. Gas Defense

a. Lectures. 3 hours.

The time allotted to this subject has not been changed, and the work will be governed by Stencil No. 157 and subsequent bulletins.

b. Practical Drill. 5 hours.

The time allotted to drill in Gas Defense will not be taken from the time allotted to Infantry Drill as has been heretofore the practice; this subject will come in the fifth and sixth weeks of the course as provided in this curriculum.

Examination

1 hour

A special, practical examination in Gas Defense

SYLLABUS FOR COURSE IN SIGNALLING
IN
UNITED STATES SCHOOLS OF MILITARY AERONAUTICS
Revised Oct. 12, 1918

II. SIGNALLING

99-54 hours.

1. The course in Fractional Signalling will vary in length for pilots, bombers, and observers, as indicated on page 1-3. Practical Signalling will mean buzzer work, occupying 25 hours for pilots, 30 for bombers, and 30 for observers, with two hours Lamp Signalling and two Radio Apparatus are to be given, and a further two hours allotted to the examination in each case. No field is required and no lectures on the theory of Radio.

2. The whole aim of the teaching should concentrate on the practical training necessary for efficient signalling from an airplane; every phase of telegraphy not essential for pilots or observers should be strictly eliminated. (For type of signals used see Stencil #294, pp. 22 - 25, 31-32.)

3. The emphasis of the course must be upon accuracy rather than upon speed, since for airplane signalling a moderate speed is quite sufficient but accuracy is absolutely necessary, not only as regards the letters and figures, but also the spacing of groups. In other words, the desire is to find the highest speed at which cadets can send, meeting the requirements as to accuracy and quality. Accuracy will be determined according to the methods of testing laid down in Form 6 C.

4. The necessary requirements for graduation will be to send 8 words per minute on the buzzer and to receive 6 words per minute. In all cases, the expression "words per minute" will mean code words of five letters sent with an accuracy of ninety-five per cent (95%) or better. Although the graduation requirement will be as stated above it is advisable at times, during the twelve week's course, to increase the practice speed to 10 or 12 words per minute. In order to keep the men alert and to give them a standard by which to judge their development, the speed may be increased and decreased for short periods, jumping from 6 words per minute to 8 or 10 for part of an hour, and then returning to a lower speed.

5. It is important that at first the instruction be entirely from the sound and not the sight of the code. Nothing printed or written should be used until the cadet is fairly familiar with the sound groups. It is a training of the ear that is desired.

6. Later in the course work with the silenced key should be stressed for the sake of training the touch independent of the ear. In signalling from an airplane the pilot has to rely on touch altogether.

7. Outline of work:

a. Morse code taught by ear. Alphabet, including "ch" (---), numerals, symbols for "break" (-...-), for correction (.....), and for end of message (.-.-) No other symbols needed. Common mistakes in forming letters. Spacing of words. Proper method of holding key, position of arm and wrist. (See Stencil 584, "ARTILLERY COOPERATION NOTES No. 7"; also Bulletin 198).

b. Practice in sending and receiving with buzzer and Morse Recorder at least a half hour every day. Two or three days of plain English. All of the rest of the work in code. Letters and figures interspersed. Spacing of groups to be emphasized. Cadets will be taught to write all messages in block (printed capital) letters. Zero is to be distinguished from the letter O by a dot in the center (0); figure 1 will be written with a short upstroke (l) to distinguish it from the letter I.

c. Work with the Lamp and the Miniature Panneau should not begin until the seventh week, when men have attained considerable proficiency with the buzzer. A total of 4 hours is to be devoted to Visual Signalling. At first, single letters to be received and written down; then groups of three or more symbols. Requirements 4 words a minute. (For description of panneau see Bulletin No. 27, Oct 11, 1917, and Photograph # 140.)

d. Two lectures on use of Radio Apparatus, in the sixth week. Parts and connections of apparatus. Importance of directional sending. Safety plug. Winding out and in or aerial. (See Stencil no. 580, pp. 5 ff.)

8. Men above average proficiency are not to be held back. One group in a class may be working at better speed than the rest. Men of previous experience may be used to send to others.

9. The fast division of each Squadron will be given "passing out" tests at the end of each week at the rate of 8 words per minute, the outer requirements for passing, the final examinations remaining the same. A cadet who "passes out" passes the course provided he attends the

classes in Visual Signalling and Radio, and practices buzzer as required at least fifteen minutes each day. He will be tested in this practice at the end of each week and a record of the test will be kept. If the record shows that his work is falling off, more than fifteen minutes practice may be required.

10. Opportunity will be given to groups of two or more students to practice buzzer work by themselves, if they care to, in any free time.

11. At the Concentration Camp, Camp Dick, weekly tests will be given in buzzer and all cadets whose work falls below standard will be put down upon a deferred list for assignment to flying school. Notice of this fact should be posted by instructors in all Radio school rooms, as it will also be posted at Camp Dick.

12. Final Examination:

a. Sending: Morse Recorder used, Men to be given list of signals in code. Signals spaced and divided into groups, with figures in different color from letters, as an aid to following the eye. A minute's practice not counted may precede the test. Each man sends for two minutes at the rate of 8 words per minute, 5 letters to a word. Each letter of the alphabet and each figure to occur at least once in the examination. A cadet making more than 5 mistakes fails.

b. Receiving: Each cadet receives buzzer code for two minutes at the rate of 6 words per minute, 5 letters to a word. A minute's practice, not counted, may precede the test. Men who receive 15 symbols wrong are graded at the passing mark 60%. Each mistake above 15 shall count 1-1/3 percent off.

c. In both sending and receiving tests intervals should occur irregularly and not uniformly at the end of five symbols. An interval omitted or misplaced should count as an error.

d. There is to be no examination on Visual Signalling or on the Radio lectures.

e. No cadet is to be passed in Signalling who does not pass the sending test. The grades made in sending and receiving by each cadet in the Pilots' course who passes the sending test are to be averaged to get his final grade in Signalling and if this grade is 60% or above he is to be considered as passing in Signalling.

SYLLABUS FOR COURSE IN AIRPLANE
UNITED STATES SCHOOLS OF MILITARY AERONAUTICS.
October 14, 1918

IV. AIRPLANES.

Introduction.

The course in Airplanes for pilots will occupy 49 hours, exclusive of the hours of instruction in swimming. Fifteen of the 49 are given to lectures, 31 are spent in practical work, and 3 are reserved for final examinations. Laboratory periods are to be 3 hours in length, or more if necessary to avoid interruptions in the performance of a definite piece of work. The aim of the lectures is: (1) to establish in the cadet's mind the fundamental principles of flight, and the necessary contributing factors thereto, so that he will have a clear understanding of the parts of the skips and their working relation with each other: (2) to make him thoroughly familiar with the training type of planes. The practical work is done with the object of (1) giving a clear meaning to the lectures, since the airplane parts referred to are seen and handled in their proper relation by the cadets themselves: (2) giving the cadet a practical grounding in the making of repairs which he may be called upon to make while in the field.

The lectures should be distributed through the practical work, in the order given. The lecture on alignment should serve as an introduction to practical work in that subject.

The course for bombers and observers consists of the first two weeks of the Pilots' course.

General References:

Signal Corps Training Manual Part I, Aviation
Section of the Signal Corps; Training Manual of the Royal Flying Corps, Part I; Air Service Handbook (Lt. Col. I. W. L. Ross), Vol. 1

PRINCIPLES, LECTURES.

1. Theory of Flight

Clear, untechnical instruction should be given on the cardinal principles and conditions of flight, as has been previously stated, especial emphasis should be laid on the various kinds of stability and the methods used for obtaining them, in order to give the cadet confidence in his machine. Formulae and mathematics will be avoided.

Under these restrictions instructors will follow their own methods in teaching the subject. Below is a list of the chief points to be covered:

- a. Primary forces - lift, drift, gravity, thrust.
- b. Secondary Factors - incidence, camber, stagger, streamline, aspect ratio, etc.
- c. Conditions necessary for flight; for speed; for climb.
- d. Balancing of forces; gliding angle; flying position, etc.
- e. Lift-drift ratio, and the factors affecting it.
- f. Stability; various kinds and how secured.
- g. Control.

References:

The Aeroplane Speaks (H. Barber); Aviation (Algeron E. Berriman); Aerial Navigation (Albert F. Zahm); Learning to Fly in the U. S. Army (E. N. Fales); The Eyes of the Army and Navy (Alvert H. Munday); Acquiring Wings (William B. Stout); Air Service Handbook; Vol. 1 (A. S. Signal Corps).

More technical, for instructors; First Annual Report of the National Advisory Committee for Aeronautics, pp. 25 - 110; Second Annual Report of the foregoing, pp. 13-14, 555-629; Military Aeroplanes and Monoplanes and Biplanes (Grover C. Loening); The Mechanics of the Aeroplane (Capt. Duchene, translated by J. H. Ledebuer); The aeroplane (A. Fage); The design of Aeroplanes (A. W. Judge); Aerodynamics and Aerodnonetics (F. W. Lanchester); Course in Aerodynamics and Airplane Design (Alexander Klemm and T. H. Huff, published August 1916 - August 1917 in "Aviation"; Aircraft Mechanics Handbook (F. H. Colvin).

Instructors are also advised to familiarize themselves with the following works, which constitute the most accessible printed "sources" of knowledge on the subject:

S. P. Langley, "Experiments in Aerodynamics", Smithsonian Institution, 1891, and "Researches and Experiments in Aerial Navigation", Gov't Printing Office, 1908.

Otto Lilienthal, "Birdflight as the Basis of Aviation," translated by A. W. Isenthal. Longmans Green, 1911.

A. S. Biffel, "The Resistance of the Air", and Other Experiments Conducted at the "Champs de Mars Laboratory," translated by Jerome C. Hunsaker, Houghton Mifflin, 1913.

Octave Chanute, "Progress in Flying Machines", M. L. Forney, N. Y., 1908, and "Recent Progress in Aviation", Annual Smithsonian report 1910

Wilbur Wright, "Experiments and Observation in Soaring Flight", 1905.

Nomenclature.

This subject will not be taught separately, as heretofore, but in connection with Rigging and Theory of Flight.

A machine with all parts labelled should be used for this lecture. Instructors will bear in mind that they should be untechnical and their object should be to teach the functioning of the parts rather than names, so that the mention of the terms will bring to the cadet's mind a whole chain of purposes and interrelations and not merely barren verbal definitions. For further guidance on this subject consult Bulletin No. 144 for All Schools.

2 Rigging.

a. Alignment (Third Week) 1 hour

Its importance in field work; necessity of pilot being able to detect faulty rigging and to correct it. Effects of flight of the most common faults in alignment; why a machine flies one wing low, nose heavy, tail-heavy, etc.

b. Materials and Stresses (Fourth Week) 1 hour.

Wood; different varieties used in airplane construction; comparative strength-weight ratios of various woods. Why wood and not metal is chiefly used in airplane construction. Factors affecting the desirability of woods for various parts; grain, seasoning, position in tree. Stresses; strain, tension, compression, torsion, bending, shearing; where found in an airplane. Factors of safety of various members.

c. Fabrics and Dopes. (Fourth Week) 1 hour.

Qualifications of an ideal fabric; of those actually used, linen and cotton. Strength and lightness. Process of covering. Purposes of dope; explanation of nitrate and acetate dopes; methods of application; inflammability. Use of varnish.

References: The Aeroplane speaks, pp. 90-114; Notes on rigging for Air Mechanics, (entire); Manuscript, Lecture Notes, S. H. A. (entire); Training Manual Royal Flying Corps, Part I; Military Aeroplanes (G. C. Loening), pp. 121 - 136; Method of Aligning of the Curtiss JN4B. (Stencil 1356)

d. Wire and Fittings (Fifth Week) 1 hours.

Kinds of wire; solid wire, aircraft strand, aircraft cord; qualities and uses of each; comparative strength. Streamlining wires. Fittings, turn-buckles, locking devices. Brief description of terminal splices (practical work under care and Repair of Machines;) comparative efficiency.

Explanation of pitch, pitch angle, ship (as untechnical as possible), balance, degree of error, surface area, camber, straightness, joints, condition of surface, mounting, care of propellers. Why two-blade propellers are best for light motors, four-blade on large motors. Construction and nomenclature.

PILOTICAL

2. Rigging, continued

20 hours.

a. Introduction (Third Week) 2 hours.

Nomenclature and construction of an airplane. Functions of the various parts; of controls. Class gathered round a labelled machine. Brief outline of the contents and purpose of Rigging; its importance to pilots. At this time a few general instructions should be given on the use of tools; which to use and not to use for certain purposes; e. g. pliers on turn-buckles. Further instruction on tools to be given when their uses are considered. The student should at this point be taught the effect of the various controls on a ship while it is in flight, i. e. result if elevator control is pushed forward or backward, action of ailerons, rudder, etc.

b. Assembling and Alignments 18 hours.

(1 hour in the third week, 4 hours in the fourth week, 4 hours in the fifth week, 6 hours in the sixth week, and 3 hours in the seventh week).

A few hours will be devoted to practice in assembling and disassembling wings, center section, spars and landing gear, in order to get the order firmly in mind. When this has been done, practice on alignment may begin. This should include, first fuselage alignment (at least two hours) and alignment of the landing gear, tail surfaces, center section and control surfaces; setting and checking lateral dihedral, stagger, incidence, wash-in and wash-out; over-all measurements; "vetting". Every cadet will assist in making all these alignments at least once, and if time permits several times. Special attention to be given to the alignment of wings and control surfaces, by eye as well as by measurement. It is to be noted that 5 hours of this work come in the 3rd and 4th weeks, 1 hour in the 3rd and 4 hours in the 4th. During this time the needs of bombers and observers are especially to be borne in mind. After the fourth week the course is for pilots only.

3 Repair of Machines.

11 hours

a. Inspection (Fourth Week) 3 hours.

(1) Detailed Inspection. This part of the course will consist of an actual systematic inspection of an airplane from the standpoint of its acceptance or rejection as unsatisfactory. This inspection should be made complete by the cadet, using forms and methods of inspection furnished all schools. Instructors will explain in detail what constitutes cause for rejection, especially with relation to the wires and faulty grain of wooden members.

(2) Inspection before Flight. This inspection should be of such character as the inspection which should usually be made by a pilot before taking to the air. The instructors should be very careful emphasize points to which the heavens or guides, landing gear fittings where they are secured to the lower longeron, tension on landing and flying wires, etc.

In all cases of inspection, the plane should be inspected by a different group of students than that which assembled it. The form of inspection will be furnished all schools promptly upon its completion.

b. Care of Machines (Fifth Week) 1 hour.

Directions for packing and unpacking, loading on trucks and unloading. Rules for daily care of airplanes and hangars. This must be done by practical demonstrations cadets assisting when necessary. (See pages 39-42, Air Service Handbook, Vol. 1)

c. Patching, Mending and Doping (Fifth Week). 3 hours

Cadets should be instructed by demonstration and actual work in making permanent and temporary patches, sewing of tears, and patching with dope. Each cadet should cover a small surface such as an aileron or rudder, sewing cloth at open end and around ribs. See Pages 46-47, Air Service Handbook, Vol. 1.

d. Splicing and Soldering. (Seventh Week). 2 hours.

Cadets will be instructed by demonstration in making Trench and American running eye splices and the relative efficiency of each. Give demonstrations of soldering, brazing, welding, showing advantages and disadvantages of each method, also hard and soft soldering processes, and purposes and use of fluxes. Explain things to be avoided such as overheating, grease, air bubbles, etc. Each cadet will make two splices.

e. Mending Longerons (Seventh Week) 1 hour

Cadets will be instructed by demonstration, in methods of mending a longeron, cutting a joint, glue, bolts, dowel pins, wrapping, varnishing, how to mend a rib web, and how to repair the leading and trailing edges of a wing.

f. Propellers (Seventh Week)

1 hour.

Explain by demonstration the use of balancing ways and checking table, checking of pitch, track, curve or camber. Cadets will do this work in groups.

Reference: Training Manual Royal Flying Corps, Part I, pp. 10-16; Signal Corps Training Manual, Part I, Chap. III. Manuscript Lecture Notes; Inspection Manual Signal Corps, U. S. A.; Aircraft Mechanics Handbook - Colvin

4. Instruments

(Third Week)

2 hours.

References: Signal Corps Training Manual, Part I, Chapters VI, VII; Training Manual Royal Flying Corps, Part I, pp. 80-100; The Eyes of the Army and Navy (A. H. Munday) Chap. X; General Specifications, pp. 25-28, Second Annual Report, National Advisory Committee for Aeronautics; Stencils Nos. 565, 662; Manuscript Lecture Notes; Instruction Manual, Instruments, issued by Air Information, Signal Corps.

Purpose and mechanism of the altimeter, barograph, air speed indicator, tachometer, oil and gas pressure gauges, gasoline gauge, drift meter, inclinometer, methods of use, setting, errors and corrections. (The compass is fully covered in the course in Navigation.)

5. Types

(Fourth Week)

2 hours.

Service Flares.

The object of this lecture is to familiarize the cadets, in a general way, with the construction and specifications of the machine now being used by the American Expeditionary Forces (See Bulletin No. 173 for All Schools), and with French, British and German machines. To aid in accomplishing the latter purpose part of the second hour should be spent on a test using silhouette cards of a few of the important types. (See Bulletin Nos. 100 and 110.)

References: Notes on the Identification of Aeroplanes; Silhouettes d'Avions: Brief Technical Descriptions of Various Airplanes (Stencil No. 876).

6 Penguins,

12 hours.

See Bulletin 327, Oct. 7, 1918.

Examination

A one hour written examination will be given at the end of the fourth week after twenty-three hours instruction. In the course for bombers and observers this will be the final examination. At the end of the seventh week a two period final written examination will be given in the course for pilots.

Note: Oral quizzes of short duration should be given at the discretion of the instructors and an examination of one-half hour's duration might well be given at the end of each week.

Syllabus for Course in Engines in
United States Schools of Military Aviation.
Oct. 14, 1918

V. ENGINES

69 hours.

Introduction.

The course in engines will occupy 69 hours, of which 16 are to be spent on lectures, 50 on practical work and 3 are to be reserved for final examinations. Laboratory periods should be 3 hours or more in length to avoid interruption in the performance of a definite piece of work.

The aim of the theoretical work or lectures will be; (1) to establish in the cadet's mind the fundamental principles of internal combustion engines and their accessories; (2) to give the cadet a clear understanding of the parts of his engine; (3) to give the cadet a thorough understanding of the working relations of each part with the object in view or preventing trouble.

Lectures should be of a demonstration nature, it being the aim of the laboratory work (1) to give a clearer meaning to the lectures, since the engine parts referred to are seen and handled by the cadets themselves, and (2) to give the cadet the technical skill required so that he will be able to make minor repairs and adjustments should be so called upon to do so while engaged in field service.

It will be noted that the first four hours of lectures and the first five hours of laboratory work must be so arranged as to make a complete fundamental course in engines for bombers and observers, as these classes of cadets are split off from the pilots at the end of the fourth week of the course, and have no further instruction in Engines.

General References:

Signal Corps Training Manual Part I. (Aviation Section, Signal Corps)
Airplane Motors - Major Geo. E. A. Hallett.
Aviation Engines - Captain Victor W. Page.
Chart for Location of Airplane Power Plant Troubles - Captain Victor W. Page.
Dyke's Automobile and Gasoline Engine Encyclopedia.
Mechanical Engineers' Handbook.
Aircraft mechanics Handbook - Colvin.

Special References:

Requirements of lubricant - body, fluidity - conductor of heat, etc. etc. Must not vaporize from heat or coagulate or leave injurious deposits, etc. Kinds of lubricants, - petroleum - castor oil. Pumps (Plunger, gear) gauge - pressure relief valve - filter screen - sump - reclamation. Lubrication Systems (force feed, full force feed, gravity and splash).

e. Cooling 1 hour

Air cooling - water cooling - radiator - water jacket - pump (gear and centrifugal) - Thermo - syphon. Anti-freezing mixtures. Advantages and disadvantages of air and water cooling.

f. Trouble Shooting 2 hours.

Causes of noisy action - misfiring - overheating - loss of power - failure to start - failure to stop - failure to throttle down - back firing.

Outline method of locating troubles by elimination-give causes and remedy for common troubles.

References: Curtis Hand Book on Standard Aircraft Motors, pp. 29-31.

2 Types

a. Rotary Engines 2 hours.

Principles of rotary engines. Arrangement of cylinders - crank shaft center - crank pin center - rotation of cylinders - firing order - rotation of pistons - transmission of power - length of stroke - reason for odd number of cylinders - cycle of operations - carburetion - valves and cams - timing of valves and magnetos. Method of lubrication - cooling materials employed - advantages and disadvantages of rotary motors. Explain difference between various types of rotary motors - Gnome - Le Rhone - Clerget.

Note. This lecture is intended only to give the cadets a general knowledge of rotary motors, a detailed study of which will be given at advanced flying school.

b. Hispano - Suiza 1 hour.

Details of construction. Method of fitting

Instruction book of ~~the~~ manufacturers.

LECTURE

1. Principles 12 hours

a. Engine Action. 3 hours.

1. Essential requirements of aerial motors. (2) Power requirements. (3) Advantage of gasoline engines. (4) General principles of explosive type of motors. (5) Lower-bore - stroke - velocity - R.P.M. - source of power - heat - pressure - transmission of power - piston - connecting rod - wrist pin - crank pin (throw) - crank web - crank shaft - intake and exhaust valves - location of valves - cam - cam shaft - cam follower - tappet rod & rocker arm - gears - gaskets bushings - bearings - bearing clearance - shims - thrust bearings. (6) Cycle of operations: (a) Intake stroke - position of valves - suction - charge - intake manifold; (b) Compression stroke - position of valves - compression - low compression - piston rings - cast iron - heat - pre-ignition; (c) Power stroke - position of valves - combustion chamber - heat loss back-kick - misfiring - exhaust valve lead; (d) Exhaust stroke - position of valves - heat loss - back firing - piston travel; (e) Valve timing - meaning - purpose - methods. (7) Multi-cylinder engine - working strokes - smooth torque - arrangement of cylinders (a) vertical; (b) Vee; - firing order.

b. Carburetion 2 hours.

Fuel - principles of carburetion - principles of the simple carburetor - float feed - Venturi tube - choke and altitude adjustments - throttle - mixing chamber - rich mixture (effect) - lean mixture (effect) - difficulties in use of single jet carburetor - Zenith carburetor - man jet - compensating jet - priming tube - priming well - effect of altitude on carburetion.

c. Ignition 3 hours.

Elementary electricity - definition of terms and units of measurements - electrical ignition systems - magnetos airplane ignition (Berling and Dixie magnetos, Delco battery system) - care and testing of magnetos - spark plugs - timing ignition - (1) meaning; (2) purpose; (3) method - **sequence of firing.** Complete instruction of Berling and Dixie magnetos or equivalent; complete instruction on Delco ignition.

d. Lubrication 1 hour.

Importance of lubrication. Oil film - fluid friction.

cylinder sleeves and discuss why aluminum castings are used - valve action - follow instruction book and bring out wherein this motor differs from the usual Vee type.

c. Liberty 1 hour.

Follow instruction book - outline cylinder construction and material valve action - angle of cylinders and why so placed - piston construction - generator installation - oiling system - bearing installation - timing firing order, etc.

PRACTICAL WORK 30 hours.

5. Showwork Sketching.

Whenever practicable student should be required to sketch various parts of engines, magnets and carburetors as well as wiring diagrams.

a. Engine Studies. 18 hours.

Cadets in groups of not less than four nor more than six, will assemble and disassemble at least two engines - check timing - clearance - lubricating systems - cooling systems - materials and specifications of each - note procedure in tearing down and assembling. Instruct in use of tools in connection with their use. Take apart and study oil and water pumps, etc., cooling and oiling systems.

b. Cooling and Oiling Systems. 1 hour.

Cadets in groups of not less than four nor more than six should fit water connections and make gaskets. By demonstration show how to stop leaks temporarily by use of taps, etc. Explain setting of oil pressure relief valve, testing flow of oil at various points.

Note: This work should be done in addition to that which is done under Engine Studies.

c. Carburetor. 2 hours.

Cadets in groups of not less than four nor more than six should take down Zenith carburetor, remove and clean all jets, check float level, remove Venturi, reassemble and install carburetor on motor, make all gaskets and check for air leaks.

d. Ignition. 6 hours.

Have cadet take apart and assemble a Dixie or a Berling magneto. In assembling cadet should assemble machine torn down by others, each magneto when assembled to be tested. Instruct as to care of magneto, etc. Each cadet to prepare chart tracing current from origin to plugs. Take down and reassemble Delco distributor and switch block. Prepare chart showing travel of current in Delco Liberty System. Check breaker points for clearance and condition. Test and flush Liberty battery.

e. Valves and Cylinders. 2 hours.

Explain by demonstration how to remove valves from cylinder --- clean the carbon from valves and cylinders and grind valves. Also demonstrate by comparison cylinders and valves in good and poor condition. Explain causes. Re-assemble valves in cylinder and show method of testing for leaks.

f. Pistons 1 hour.

Explain by demonstration when a piston is in poor and when in good condition. Show method of cleaning thoroughly and brushing with mineral wool. Outline importance of cleaning ring grooves thoroughly and having proper elasticity to the rings, and not too much side play in grooves. Demonstrate good and bad rings, explain clearances. Show method of fitting oversize rings.

g. Bearings 1 hour.

Explain what is meant by bearing clearance, why differences are allowed in various motors, why some bearings have oil grooves and other are plain. By demonstration show how to fit a connecting rod bearing and cap. Explain the use of bearing scraper and how to secure clearance. Familiarize cadet with amount of pull necessary to turn over motor in which bearings are properly fitted.

h. Inspection before Flight. 1 hour.

Outlining systematic method of inspecting motors and accessories previous to flight. The form for this inspection is being made up and will be furnished all schools.

4. Engines Running.

Trouble Shooting.

Cadets will locate and correct faults in carburetion and ignition system of motors on test blocks, set oil pressure relief valves, find causes of overheating, irregular and back

firing, etc. Motors should be prepared for trouble shooting by instructors in such troubles as bent valve, improper timing, insufficient valve clearances, bent rocker arms, plugged carburetor jets, short circuited plugs, water in carburetor bowl, etc., and the method of adjustment explained. Cadets should be required to adjust motor so as to have it functioning properly at the required number of RPM with standard propeller or brake installed.

Reference: Curtiss Hand Book on Standard Model OX Motors, pp. 29 - 34.

Examinations

A one hour written examination will be given at the end of the fourth week after nine hours of instruction. In the courses for bombers and observers this will be the final examination. At the end of the ninth week a two period final written examination will be given in the course for pilots.

Quizzes:

NOTE:

Quizzes of short duration should be given at the discretion of the instructors and an examination of one-half hour's duration might well be given at the end of each week.

STANDARD FOR COURSE IN GUNNERY IN UNITED STATES
SCHOOLS OF MILITARY ARTS AND SCIENCES
Revised October 14, 1918

FOR PISTOLS

Subjects of instruction will be as follows;

<u>1. Lewis Gun</u>	<u>Time allotted.</u>
a. General description and nomenclature	3 hours
b. Mechanism (notes to be given in full from stencil)	6 "
c. Stripping	4 "
d. Drill	1 "
e. Stoppages and immediate action (Indoor Work)	2 "
f. Care and Cleaning (notes to be given in full from stencil)	2 "
g. Points before and after firing on range	1 "
h. Testing magazines, ammunition, etc.	1 "
	<hr/> 20 hours.
<u>2. Maxim Gun.</u>	
a. General Description	3 "
b. Mechanism (notes to be given in full from stencil)	6 "
c. Stripping	5 "
d. Drill (Loading and unloading)	2 "
e. Stoppages and immediate action	2 "
f. Care and cleaning	1 "
g. Points before and after firing on range.	2 "
	<hr/> 23 hours
<u>3. Ring Sights, Norman Vane Foresight and Sighting</u>	0 "
(Under Ring Sights may be included the necessary instruction in the application of the Ring Sight to Trap Shooting.)	
<u>4. Traps with Ring Sights</u>	10 "
(Not to exceed 25 rds. per period.)	
<u>5. C. C. Gear</u>	
(Nomenclature and Mechanism only)	
	2 "
<u>Ammunition</u>	2 "
	<hr/>
Total	62 hours.

No range work will be carried out at Ground Schools

FOR BOWMEN

Subjects of instruction will be as follows:

1. <u>Lewis Gun</u>	Time allotted
a. General description and nomenclature	3 hours.
b. Mechanism (notes to be given in full from stencil)	6 "
c. Stripping	4 "
d. Drill	2 "
e. Stoppages and immediate action (Indoor work)	3 "
f. Care and Cleaning (notes to be given in full from stencil)	3 "
g. Points before and after firing on range	1 "
h. Testing magazines, ammunition, etc.	2 "
	<hr/> 31 hours
2. <u>Ring Sights, Norman Vane Foresight and Aiming</u>	5 "
(Under Ring Sight to be included the necessary instruction in the application of the Ring Sight to Trap Shooting.)	
3. <u>Traps, with ring sights</u>	
(Not to exceed 25 rds, per period)	
<u>Examination</u>	2 "
Total	<hr/> 38

FOR OBSERVERS, CORPS D'ARMEE

Subjects of instruction will be as follows:

1. <u>Lewis Gun</u>	Time allotted
a. General description and nomenclature	3 hours.
b. Mechanism (notes to be given in full from stencil)	6 hours.
c. Stripping	4 "
d. Drill	2 "
e. Stoppages and immediate action (Indoor Work)	3 "
f. Care and Cleaning (Notes to be given in full from Stencil)	3 "
g. Points before and after firing on range	2 "
h. Testing magazines, ammunition, etc.	2 "
	<hr/> 25 hours
2. <u>Ring Sights, Norman Vane Foresight and Aiming</u>	
(Under Ring Sights may be included the necessary instruction in the application of the Ring Sight to Trap Shooting)	
3. <u>Traps, with ring sights</u>	
(Not to exceed 25 rds. per period)	
<u>Examination</u>	10 "
Total	<hr/> 42 hours.

FOR FIGHTING OBSERVERS

The requirements as to instruction and the final examination in Gunnery for fighting observer candidates will be the same as those in the course for observers.

No range work will be carried out at Ground Schools.

SYLLABUS FOR COURSE IN ORIENTATION

UNITED STATES DEPARTMENT OF THE ARMY
October 14, 1918

VI. COURSE OBJECTIVE

66 hours.

1. Maps

This course consists of two parts, (a) Maps, 10 hours and (b) Geography, 8 hours, with an examination of 1 hour covering both subjects.

a. Maps 10 hours.

References: As given in Stencil No. 157; also Stencil No. 1. S. 300; the page references in the description of the course which follows are to the papers of Stencil No. 1. S. 300.

Each lecture should be of one hour's duration, followed by one or more hours of laboratory exercises as suggested, in order to apply the principles explained in the lectures and drive them home by reiterated application.

Lecture 1, (pp. 1-5, omitting Orientation) 1 hour
Laboratory, 1 hour.

Exercises based on the above lecture, including not only such examples as are given on p. 5, but also examples on distance and time scales, and problems in the use of R. F.

Lecture 2. (pp. 7 - 13) 1 hour.
Laboratory, 2 hours

Exercises based on the above lecture, one of which should be devoted to sketching a contour map to conform to a complete detailed description. This description should be such as to require the use of the more common conventional signs as well as various combinations of contours.

Lecture 3 (pp. 14-17) 1 hour.
Laboratory, 1 hour.

Exercises on pin-pointing and practice with the British system.

Lecture 4. (pp. 17-19 and the paragraphs on Orientation, p. 2.) 1 hour.
Laboratory, 1 hour.

Problems with French maps, and one-half hours quiz on the course to this point.

Laboratory, 1 hour.

Exercises in Orientation and pin pointing on the rotary map.

Examination. One-half the examination provided in the fourth week will be devoted to testing the cadets in the foregoing work.

b. Geography. 8 hours.

Purposes:

- (1) To give the cadets some introductory knowledge of maps.
- (2) To give the cadets a thorough knowledge of the salient features of the geography of Northwestern Europe. The ability to make a freehand map of this region, showing the chief mountains, rivers and cities, and the boundaries of the countries studied, will be considered an essential test of the cadet's mastery of this part of the course.
- (3) To give the cadets a sufficiently close knowledge of the Western Front to enable them to understand and remember the general course of the War in that region.
- (4) To acquaint the cadets with German industrial geography, routes of transportation, centers of distribution, etc.

Distribution of Time.

Lecture on maps in general. 1 hour.

Lecture on the freehand map of the Northwestern Europe. 1 hr.

Drill in black-board work, etc. on the freehand map. 2 hrs.

(See attached photograph)

Lectures on the geography of the Western Front and the course of the War to date in that region. 3 hours.

Lectures on German industrial geography. Transportation, coal and iron deposits, industrial centers, etc. 1 hour.

Examination.

One half the hour to be devoted to maps and one half to the foregoing course in Geography.

Details of the Course in Geography.

(1) Maps.

(a) Finding North.

By night; the North Star, and the neighboring constellations.

By day; the sun and the watch; the usual orientation of churches in Europe; the flow of rivers of Northwestern Europe.

(b) Meridians.

Meridian's projection and other compromises.

(c) Parallels of latitude. Latitude and longitude, Value of a degree.

(d) Scales.

R. F.

Comparative areas, Europe and U. S.

Latitude of European countries compared with U. S.
(Davis, Page 3)

(e) The Geography of Northwestern Europe.

a. Mountains and plains.

1. The Alps.
2. The Vosges.
3. Mountains of Germany.
4. The Ardennes.
5. The Paris basin.
6. The coastal plains of
 - a. France
 - b. Belgium.
 - c. Holland
7. The great German Lowlands.

b. Rivers.

1. General remarks (Character, direction of flow, etc)
2. The seine and its system.
3. The Somme.
4. The Meuse and the Sambre.
5. The Moselle.
6. The Rhine and its other tributaries.
7. The Weser.
8. The Elbe.

(c) States and boundary lines.

Shapes and directions emphasized.

Instruction in drawing the freehand map.

d. Routes of travel and communication

1. Distributing centers.
2. Ports.
3. Railways and bridges.
4. Main high-roads.
5. Canals.

3. Drill on the freehand map. 1 hour.

This drill should be done with small sections of not more than 15 cadets. Each should receive thorough drill at the blackboard and on paper. The map should be drawn again and again.

starting from all sorts of points of departure - such as a boundary line, a city, a mountain range, etc. etc., Special care should be given to relative proportions and directions.

4. Continuation of drill on freehand map. 1 hour.

The location on the map of the rivers named in #2 and of the following town should be made with a good deal of accuracy.

- | | |
|------------------|----------------|
| 1. St. Nazaire. | 12. Antwerp |
| 2. Le Havre | 13. Brussels |
| 3. Paris | 14. The Hague |
| 4. Nancy | 15. Strasbourg |
| 5. Metz | 16. Frankfurt |
| 6. Amiens | 17. Coblenz |
| 7. Calais | 18. Cologne |
| 8. London | 19. Bremen |
| 9. Dover | 20. Hamburg |
| 10. Southampton. | 21. Berlin |
| 11. Plymouth. | 22. Rangoon. |

Practice should be given in estimating distances, both from memory and from the map itself.

(5), (6), (7). The Western Front. 3 hours.

The discussion in these three lectures should not attempt to deal with tactics but with the effect of the local topography on the general course of operations on the Western Front from 1914 to the present date. An excellent basis for these lectures will be found in the following two books:

Johnson, D. W., "Topography and Strategy in the War"

Davis, W. M., "Handbook of Northern France."

Any standard works on the course of the War in the West will assist the instructor to work out an authoritative outline of the sequence of events, but it should never be lost sight of that the object of the whole study is to show the close relation between topography and strategy.

The battle fronts should be located on the freehand map, and then studied more in detail. The positions of famous points should be emphasized, such as:

- | | |
|------------------------------------|-------------|
| Martenswillerkopf | The Warne. |
| Fontenoy-Mousson | The Vesle. |
| St. Mihiel | The Aisne |
| Verdun | The Ailette |
| Marsh of St. Gond. | The Oise. |
| Chateau Thierry | The Somme. |
| Forest of St. Gobain | The Canals. |
| Combrail | |
| Arras. | |
| Ypres and the Passchendaele Ridge. | |

Lines of communication should be discussed, and the understanding given of the limitations to the use of numbers of troops on a limited front.

(8) Industrial Geography of Germany. 1 hour

The object of this lecture is to familiarize the cadets with the general distribution of German industries, and with the German railway systems. A secondary object is to assist on airplane to find its bearings on the German side of the lines, and for this purpose emphasis should be placed on the location of principal manufacturing districts and their relations to rivers and railways; on the location and extent of agricultural districts; mining regions; the Rhine bridges; cathedral towns and their surroundings; main high-roads; etc., etc.

Navigation 1 1/2 hour

1. Navigation

References: Stencil No. 1. S. 268 (Page references in the following outline of lectures are to this stencil.)

It is to be noted that the division of the subject matter into five lectures as here outlined is not obligatory but that the instructor may alter the division or the number of lectures if experience proves it desirable. In all, fifteen hours are to be devoted to Navigation; it is believed that the best results will be obtained by giving the larger part of this time to the working out of problems with the floor map and rotary map. Problems in Navigation may be combined with the problems nos. 4 and 5 for the rotary map outlined in Bulletin No. 289.

Lecture I. (pp. 1 - 10, through para. VII)

Lecture II. (pp. 25-27 and 10-13)

Lecture III. (pp. 30-34)

Navigation and Problems

Lectures IV & V (pp. 14-19)

Use of instruments and application to problems

Ten hours to be given in the miniature range on problems in Navigation. Problems like those described on page 26, Stencil No. 107, numbers I, II, III, and XIII are to be used, with the addition to each of a wind factor. Also a problem dealing with a ship headed on a certain compass bearing, with a given air speed, observed to be actually making good a somewhat different course, at a different ground speed, the problem requiring the force and direction of the wind.

Navigation

A final examination of one hour in Navigation will be given in the sixth week of the observers' and bombers' courses. In the pilots' course a final examination of one hour in Navigation and Meteorology will be given in the eight week.

7. Meteorology

The reference for these two lectures will be found on page 10 of Standard No. 187. The outline of the course to be covered, on page 10.

Examination

A final examination of one hour will be given on the combined subjects of Navigation and Meteorology in the eight week of the pilots' course. 1 hour

4. Cooperation with Artillery -- Lectures (for pilots and observers only) 5 hours.

Course

a. Explanation of range and fire control tables. Use of coordinates. 1 hour

b. Preliminary practice in fire control, oral or written; all the class observing. 1 hour.

c. Reporting of points (bursts) by buzzer. Half class may act as observers and half as wireless officers, the latter receiving the reports from the former, writing them down and handing them in to the instructor. Class changes places every half hour. If this is impossible, some other arrangement may be made, with the purpose always in view of giving every man the longest possible time at the key. 2 hours.

Final Examination

A final examination of one hour will be given on Cooperation with Artillery in the seventh week of the observers' course.

(In the course for bombers 9 hours in Bombing will be given in place of the course in Cooperation with Artillery. The outline for this course is to be forwarded later.)

5. Photographic Interpretation. For pilots & bombers 18 hrs.

The outline of this course will be forwarded later.

Examination 2 hours.

THE HISTORY OF THE
SCHOOL

The first building was first
started, and Hall of Cornell
University was used for Hospital,

Schoelkopf Hall for Radio and lectures in other subjects,
and the Baseball Cage for Airplane and Miniature range.

Buzzers were installed in Schoelkopf Hall, and some classes
were held there. Schoelkopf Hall was also used for all the
instruction, office and store rooms. Military exercises were
held on the Cornell University Rifle Range about a mile from
the Campus. After a few weeks, buzzers were installed in
the "old mess hall", thereby following Schoelkopf Hall a great
deal of unnecessary noise. The Medical Department used the
space of the Cornell University Medical Department. in the
gymnasium and arrangement were made to care for the sick in
the Cornell Infirmary.

The Cornell University Athletic Association was
very generous with its property. Its headquarters building,
Schoelkopf Hall, was used as a mess hall by the
Flying Cadets and later by the Photographic Cadets. Its
Baseball Cage was used as an Airplane Laboratory and
Miniature Range and later as a Y.M.C.A. headquarters. The
Engine Test Shed was built on a foundation belonging to the
Association and the Mess Hall was built on its property. The
upper and lower drill fields used by both the School of
Military Aeronautics and the School of Aerial Photography
were contributed by it.

In September 1917 the Trustees of Cornell University authorized the expenditure of \$44,000 for special construction of Mess Hall, Latrines, Engine Test Shed, etc., for the school and shortly thereafter the sum was increased to \$52,000.

On September 21, 1917, the school was moved to the "New York State Drill Hall", on the Cornell University Campus, which had been sufficiently completed for occupancy. One-half of the large drill space was allotted to be used as laboratories for engines, machine guns, airplanes, and miniature range. The original plan was to have the cadets sleep in the tower rooms. The administration offices of the Commandant and President of the Academic Board were in the large room on the first floor of the North Tower. The top tower rooms were to be used as class rooms and the hallway under the balcony was to be used for mess, and rooms in the south end of the first floor for kitchens.

The Engine Test Shed, built on the concrete foundation of an old barn south of the New Drill Hall, was completed and put into operation on September 24, 1917. About this time a latrine was built south of, and adjacent to, the Drill Hall to supplement the lavatory in the building.

The Office of the Chief Signal Officer now asked if Cornell could take seventy-five cadets per week, and plans were at once made to enlarge the laboratories and

other facilities. The entire Drill Space was floored over and partitioned off, the western half to be used as sleeping quarters, the southeast quarter as an airplane laboratory, a third of the northeast quarter for engines, a third for machine guns, and a third for miniature range. The Commandant took the entire room on the first floor of the North Tower and the President of the Academic Board the room north of the middle entrance on the first floor. When the Mess Hall, constructed south of the New Drill hall was completed, November 24, the rooms on the south side of the middle entrance on the first floor were used as offices for the Military Department and Signalling Department. The large room on the first floor of the South Tower and the balcony along the west end of the armory was fitted up for signal practice and instruction. The North Tower was given over to offices, Medical Department, on ground floor; Administration on first floor, Quartermaster, second; Angles and Air to Flight on the third; and Airplanes and Observation on the fourth. Gunnery had the ground floor room in the South Tower. Store rooms for the Quartermaster were constructed in the basement. A Post Exchange and receiving room were established in rooms in the basement. The rooms in the South Tower were used for class rooms. On the north side of the Drill Hall a second latrine with thirty showers was constructed.

A sixteen foot pathway leading to the laboratories was partitioned off thru the middle of the sleeping quarters. A post office, tool and stock room, and small government storeroom were constructed opening into this pathway. Notices of all kinds and the marks for the cadets were posted in this pathway, dubbed "No Man's Land" by the cadets. The space under the balcony was fitted up with tables for study. A machine shop was installed and from three to six mechanics, electricians, and carpenters were constantly employed in making models, tools, and other equipment for the school.

A building was constructed in the latter part of November, 1917, for machine gun firing. It was situated in the Cascadilla Creek Gorge about five hundred yards from the New Drill Hall.

A trap shooting range was constructed north of Fall Creek about three-fourths mile from the New Drill Hall and put into operation in the latter part of April 1918. A fireproof warehouse was furnished just north of the Drill Hall on July 5, 1918.

A Medical Research Laboratory was started in the Forestry Building in October 1918, but never completed, and about the same time a canvas hangar for Penguins was set up on the field east of the New Drill Hall

PHYSICAL EDUCATION

Engine instructions was begun on a Curtiss OX already in the

possession of Cornell University and engine parts borrowed from the Thomas-Morse Aircraft Corporation. Another Curtiss and a Hall Scott motor sent by the Schools Division arrived just after the instruction started. This equipment was added to from time to time until at the close the School had forty-six engines: 14 Curtiss OX's; 2 Curtiss v-2's (8 cyl.); 9 Hall Scotts (6 cyl.); 8 Sturtevents (8 cyl.); 6 Le Rhones (9 cyl.); 1 Gnome (9 cyl.); 1 Clerget (9 cyl.); 1 Hispano Suiza (8 cyl.); 3 Liberties (12 cyl.); and 1 L'Aviator (8 cyl.). Of these 1 Curtiss, 1 Sturtevent, and 2 Hall Scotts were set up for running in the Engine Test Shed.

The Government also furnished a number of extra carburetors and magnetos. The Engine Department, with the aid of the School's Mechanics, constructed various models showing the parts and operation of simple gasoline engines, the action of Gnome engines, the Delco ignition system for Liberty engines, and the functioning of magnetos, carburetors, and of the water circulation systems. Also this department prepared about thirty large colored charts showing engine parts. Blue prints of most of these charts were sent to the other Schools of Military Aeronautics at the request of the Ground Schools Branch of the Training Section.

The Airplane Department's equipment consisted of six Curtiss J N 4's; two Curtiss fuselages; 2 Standards;

1 Burgess, 1 Sturtevant Sea Plane; 1 L.W.F. (never assembled because bracing wires never reached the School); and one Thomas-Morse Scout. In addition the University furnished wire, torches, and soldering irons for wire splicing, wood and carpentering tools for longeron splicing, material and dope for wing covering and repair, and tools, etc., needed for rigging and alignment, and propeller testing outfit. Also it constructed an amphitheatre into which a stripped airplane, propeller testing apparatus, or other equipment could be brought for demonstration.

The work in Gunnery began on an old Colt machine gun belonging to the Cornell R.D.T.C. A British model Lewis gun arrived shortly. When the School was discontinued it had twenty-five American Lewis Aircraft Guns and twenty-two Marlin Aircraft Guns. At one time there were twenty-two Lewis ground guns. Six Vickers machine guns were shipped here, but were never used for instruction because orders came cancelling the work on them. In addition to these guns, the laboratory had tripods for mounting them and paraphernalia for striping guns and holding the parts. Targets and sights were used for sighting practice and a mounting for holding the Lewis gun in the plane was set up in the laboratory for a time. A large number of colored charts were prepared by this department to supplement those sent by the Government. Shotguns, clay pigeons, and

ammunition for the range completed the equipment.

When the miniature range was first constructed in the baseball cage, there was one landscape with a platform, to hold a single man, about 10 feet over it. The later equipment consisted of a tower 16 feet high and 25 feet square with a platform 5 feet wide around it, with the map on the floor in the center. Four men were seated on the platform on each side of the map in models of fuselages. These models were covered to represent the actual fuselage and were fitted with map boards, sending and receiving keys in service, connecting plugs, devices to simulate letting out of the wireless aerial, and head receivers. The instructors desk below was fitted up with the necessary electric apparatus to give practice in prearranged and impromptu shoots, showing signals, etc. The completed range consisted of six of these towers arranged together so that sixteen men could be seated around each of six landscapes. Five of these landscapes were prepared, but never more than four were used at one time. A rotary landscape was installed in one of the towers in the last part of May, 1918.

The Map Reading Department had maps of Cornell University and Vicinity on a scale of 6" to the mile mounted on thin boards two feet square. These maps were used in taking the men on walks around the country, the topography of which was excellent for instruction in this course.

A large collection of charts and lantern slides were used and several models of most of the instruments used in airplanes were in stock and were exhibited to the cadets.

The office of the President of the Academic Board was equipped with materials and instruments for making large wall charts used in instruction. A man was employed for the purpose of making them.

Subscription to a number of magazines of interest to men in the Air Service were kept up and the books were available to the instructing staff.

In addition a stock room was maintained in the office of the President of the Academic Board where all kinds of office supplies could be obtained by the staff. At another stock room examination blanks and quiz sheets could be obtained.

The first cadets were quartered in Schoelkopf Hall, QUARTERS but the school soon outgrew its quarters there and

the Junior Wing was moved to the Old University Armory. When the offices were moved into the New Drill Hall, the Senior Wing took up quarters in the rooms in the towers, but soon the entire edge was jammed on the main drill floor. The lavatory facilities were too small for the increased number of cadets, so additional latrines and showers were constructed north and south of the Hall, near stairways adjacent to the sleeping quarters. At the head of and between each two cots a frame with two rows of hooks

and two shelves for books and placed for the convenience of the cadets. For a while the Quartermaster issued locker trunks for the use of the cadets while they were in the School, but this was discontinued later.

A guard room was maintained in the basement.

As a rule the officers and instructors found quarters in the various rooming houses near the campus. During the summer of 1917, a few of the men clubbed together and rented a house on the campus near the School. This came to be called the Officers' Club because most of the men who lived there were officers. In September 1918 and Officers' Club was really formed by the officers in the School of Military Aeronautics, Photography School, Vocational School, and Students' Army Training Corps, which were running in the University. The Telluride Association gave the club free use of its house.

The first squadrons were marched to the
 THE MESS University cafeterias in the Domestic
 Economy Building and in Cascadilla Hall.

When the University term closed in June, 1917 the dining room in Sage Dormitory for women was used. The cadets went back to the cafeteria in Cascadilla Hall when Summer School opened. This cafeteria was open to the public each day after the cadets had finished their mess. Instructors and officers who desired ate with the cadets. When the school moved into the New Drill Hall

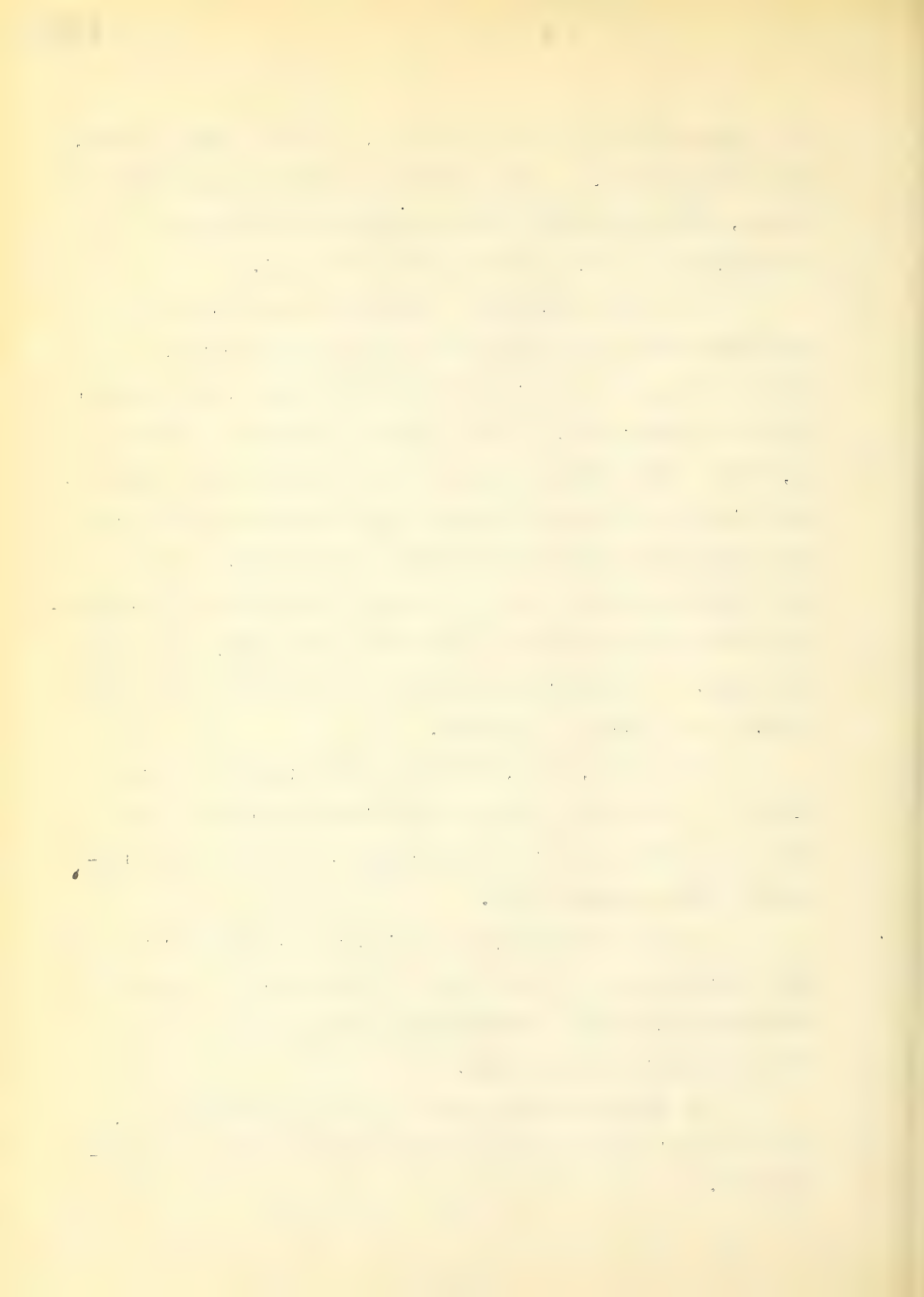
the cadets were all messed together, on the cafeteria plan, under the balcony. The cooking was done in Sage Dormitory nearby, and only coffee, bread and selections were kept in the rooms used as kitchens in the New Drill Hall.

A large building to accomodate one thousand was now constructed across the road south of the School. The kitchen occupied a section between two dining rooms arranged to form a letter "H". This building was opened November 24, 1918. The cafeteria plan of serving was still followed. The University furnished kitchen help and only waiters and mess sergeants were taken from the cadet corps. The mess sergeant helped check up numbers and supervised waiters. The cadets from the School of Aerial Photography ate in the same Hall. A table was reserved for such instructors and officers as cared to eat there.

On July 1, 1918, the mess was taken over by an officer of the school and run according to the ordinary army plan instead of by the University. It was very successful from the beginning.

A post commissary for officers and enlisted men was also maintained. At the close of the School of Military Aeronautics the Mess Officers were transferred to the School of Aerial Photography.

An excellent mess for Officers was maintained at the Officers' Club in the Telluride House after its establishment.



INSTRUCTION

PROBLEMS

EXPERIENCE

OF INSTRUCTORS

From the beginning, one of the chief difficulties lay in obtaining instructors with previous experience in both teaching and aeronautics. The school was very fortunate, however, in securing the services of a few men from Cornell University staff who were highly trained along lines which made it comparatively easy for them to take up their new duties. From the College of Mechanical Engineering, Professor F. G. Allenwood and Professor C. A. Morse of the Heat-Power Engineering Department came to take charge of the work in Engines. Professor Ernest Blaker of the Physics Department of the College of Arts and Sciences came to take charge of Radio, Theory of Flight and Meteorology and later of the entire "Airplanes" group. Professor L. A. Lawrence left the Department of Surveying of the College of Civil Engineering to take charge of Instruments and Compasses, Map Reading, Astronomy, Photography, etc., and later of the "Aids to Flight" and "Observation" groups. Under these men the various departments of which they were in charge became highly efficient.

G. M. James of the English Army Service Corps who was convalescing in Ithaca when the school was established took charge of the work in Miniature Range, Bombs and Bombing, and Co-operation with Artillery. He continued in charge of that work until Feb. 1, 1918, when he left to

to take a position with a Chemical Company.

A wounded Corporal of a Canadian Machine Gun Company had charge of the work in Gunnery but was not satisfactory on account of poor education and a convivial temperament.

With the expansion of the school it became necessary to enlarge the teaching staff continually. A number of difficulties were encountered. Men of proper calibre wanted to go to Officers' Training Camps so they could be commissioned. The monotonous character of the work, which was the same from week to week, did not appeal to them.

However, Professor Barnard built up a corps of highly trained and efficient instructors. It was not so difficult to secure men for the Engine Department. A few of the staff of the College of Mechanical Engineering were secured. The others were for the most part recent graduates who had had experience in automobile construction or other internal combustion engine work.

It was difficult of course to secure men for gunnery. For awhile a cadet who had had some flying experience was relieved of his studies and assisted. A man was employed and sent to the plant of the Savage Arms Company to learn the Lewis Gun. Two men were sent to the Royal Flying Corps School at Toronto for instruction. Before they returned the man had returned from the Savage Arms Company and had taken charge of the work so they were used

in other departments. After this, men of technical training or special teaching ability were employed and studied in the department until competent to begin giving instruction. This method was very satisfactory.

At various times members of the departments were sent elsewhere for special training; two went to study the Paris Machine Gun at the Service des Carrières, one to the Springfield Arsenal, one to Ellington Field, and one to Princeton for a special course for officers in charge of gunnery instruction.

In the spring of 1918 a number of enlisted men from a gunnery school in Texas were sent to the school. They were, as a rule, men of little education and their work with their department in the laboratory was very poor. They made their teaching efficiency low and soon lost them the respect of the cadets, who were used to a higher type.

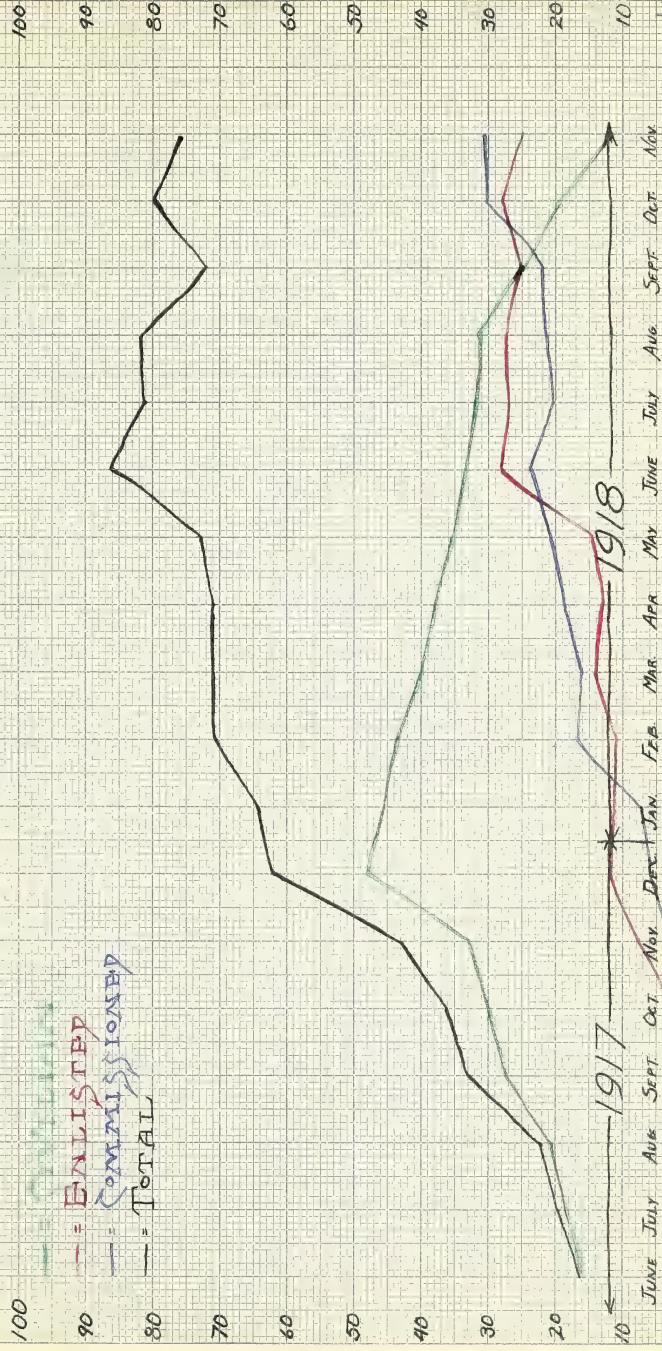
In the Airplane Group a similar plan was followed for training instructors at the school. A few men who had studied aeronautics as a pastime, and several who had worked in the Signal Corps during the war, were on the staff. Others were taken from the ranks in the Signal Corps. Some of the better qualified instructors were pulled from other departments, who were better qualified, became available.

The Signal Corps was very successful with some students of the Cornell R.O.T.C. They were added to from time to time and the Signal Corps was very successful in its work.

The first instruction in the military organization
 was given by the first officer in the school. . .
 They were gradually commissioned or replaced by officers
 sent here by the School Division.

Discontinue instruction at page 136

INSTRUCTING STAFF





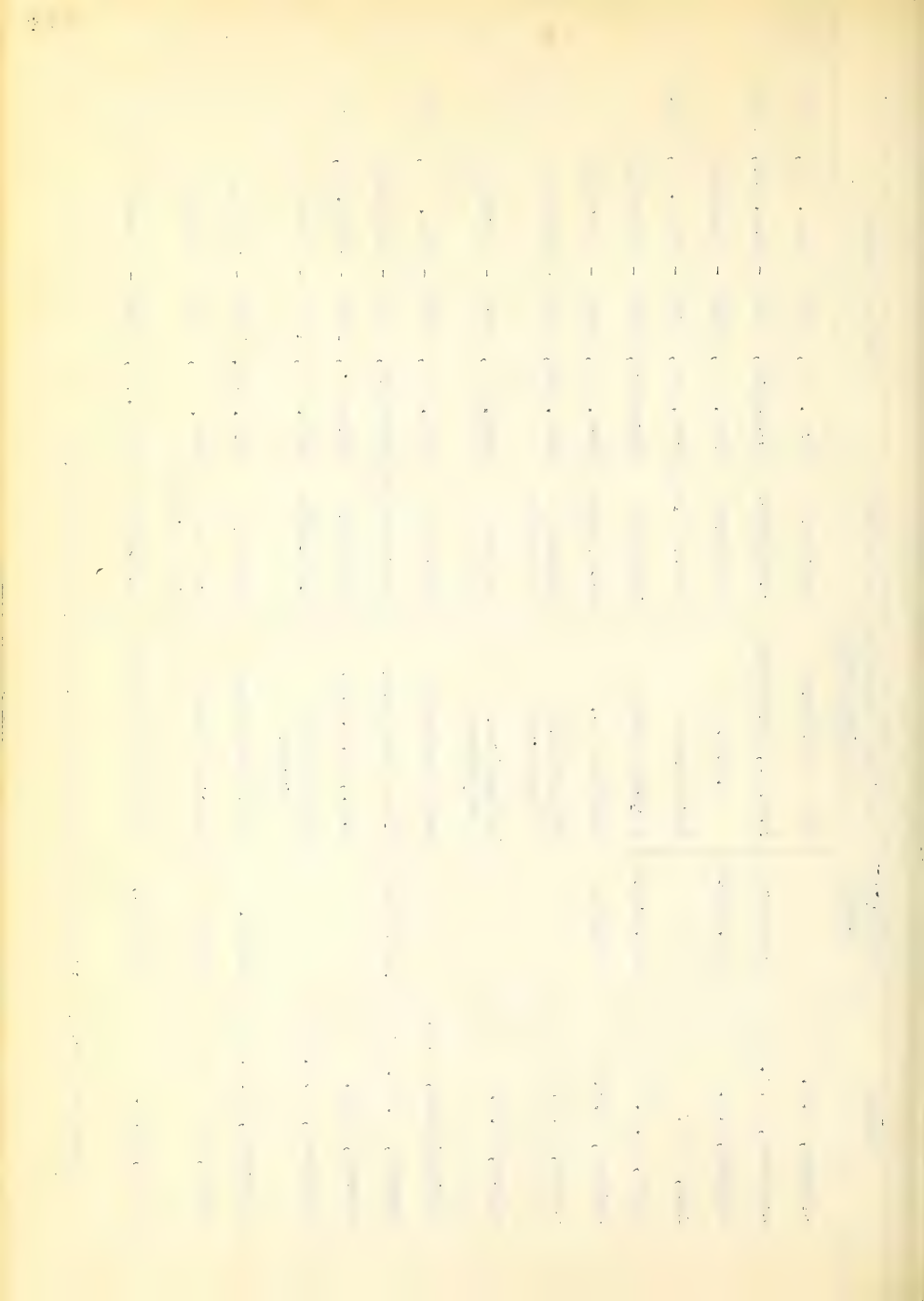
THE INSTRUCTING STAFF

THE ACADEMIC BOARD

NAME	SPECIAL TRAINING OR EXPERIENCE	DUTIES	TIME AT SCHOOL
Barnard, W.N.	Mechanical Engineer. Professor of Power Engineering in Cornell University.	President of Academic Board	July 12, 1917 to Closing
Blaker, Ernest	Civil Engineer. Professor of Physics in Cornell University.	Member of Academic Board Head of Airplanes Closing Department	June 11, 1917 to Closing
Ellenwood, F.O.	Mechanical Engineer. Professor of Heat-Power Engineering, Cornell University.	Member of Academic Board. Head of Engines Department	June 11, 1917 to Closing
Lawrence, L.A.	Civil Engineer. Professor of Civil Engineering in Cornell University.	Member of Academic Board. Head of Dept. of Observation	June 11, 1917 to Closing

NAME	MILITARY RANK	SPECIAL TRAINING or EXPERIENCE	DEPARTMENT	TIME AT SCHOOL
Ahrens, W.W.		Civil Engineer	Engines	Jan. 13, 1918 - Aug. 24, 1918
Andrews, J.F.	Private	S.M.A., Atlantat	Airplanes	June 10, 1918 - Aug. 24, 1918
Arnold, W.C.	1st.Lieut	O.T.C.	Military	Feb. 8, 1918 - Closing
Ash, H.M.		Telegrapher	Signalling	Feb. 18, 1918 - Sept. 1, 1918
Ault, L.V.	1st.Lieut	Regular Army	Military	Sept.30, 1918 - Closing
Bailey, F.E. *	Private	Custiss Co.	Airplanes	Dec. 7, 1917 - Closing
Banks, D.K.		Mechanical Engineer	Gunnery & Engines	Nov. 20, 1917 - Closing
Banks, M.H.		Mechanical Engineer	Engines	Jan. 7, 1918 - Closing
Bartholomew, B.B.		Auto Mechanic	Engines	Oct. 2, 1917 - Jan. 1, 1918
Penson, C. B. *	1st.Lieut	Civil Engineer	Observation	June 18, 1917 - Closing
Benson, G.A.		C.U., R.O.T.C.	Military	June 4, 1917 - Sept.27, 1917
Blackman, J.W. Jr		Trained at School	Airplanes	Feb. 7, 1918 - Closing
Blackman, R.I. *	Sergt.	Civil Engineer	Gunnery	Nov. 21, 1917 - Closing
Blair, E.	Captain	Regular Army	Head Military Studies	Oct. 6, 1918 - Closing
Bloom, E.I.	2ndLieut.	Military Aviator	Airplanes	Sept.14, 1918 - Closing

*Commissioned or enlisted while holding position indicated.



NAME	MILITARY RANK	SPECIAL TRAINING OR EXPERIENCE	DEPARTMENT	TIME AT SCHOOL
Bourdette, H.B.	Private	Foreman, Carbur- etor Factory	Engines	May 6, 1918 - Closing
Bouton, E.P.	Sergt.	Civil Engineer	Gunnery	Jan. 21, 1918 - Closing.
Bowen, O.G. *	Private	Teacher	Gunnery	Nov. 3, 1917 - Oct. 23, 1918.
Brown, C.L.	Pvt.1/Cl.	S.M.A., Columbus Mechanical Engineer	Engines	Sept.27, 1918 - Oct. 24, 1918.
Brownback, H.L.	1st Lieut.	S.M.A., Columbus	Gunnery	May 30, 1917 - Sept.15, 1917.
Buall, L.M.	1st Lieut.	Capt. C.U. R.O.T.C.	Military	May 25, 1918 - July 1, 1918.
Bull, W.F.	2nd Lieut.	Auto business	Military	June 4, 1917 - Nov. 7, 1917.
Cady, F.W.*		Civil Engineer	Engines	Nov. 22, 1917 - Closing
Cameron, B.H.		C.U. R.O.T.C.	Gunnery	Nov. 12, 1917 - Closing
Chadeayne, H.F.		Curtis Co.	Military	Nov. 27, 1917 - June 3, 1918.
Christian, C.M.		Ambulance Driver, France	Airplanes	Nov. 20, 1917 - Mar. 1, 1918.
Clapp, R.D.W.		S.M.A.	Military	Jan. 7, 1918 - Closing
Clark, A.L.		Government Gun- nery School	Engines	Oct. 30, 1917 - Dec. 10, 1917.
Clark, P.L.		Mechanical Engin- eering Student	Airplanes	Oct. 30, 1917 - Jan. 1, 1918, May 3, 1918 - Aug. 24, 1918.
Cole, C.A.	Private		Gunnery	Mar. 19, 1918 - Oct. 28, 1918.
Collin, H.A.			Engines	Dec. 3, 1917 - July 13, 1918.

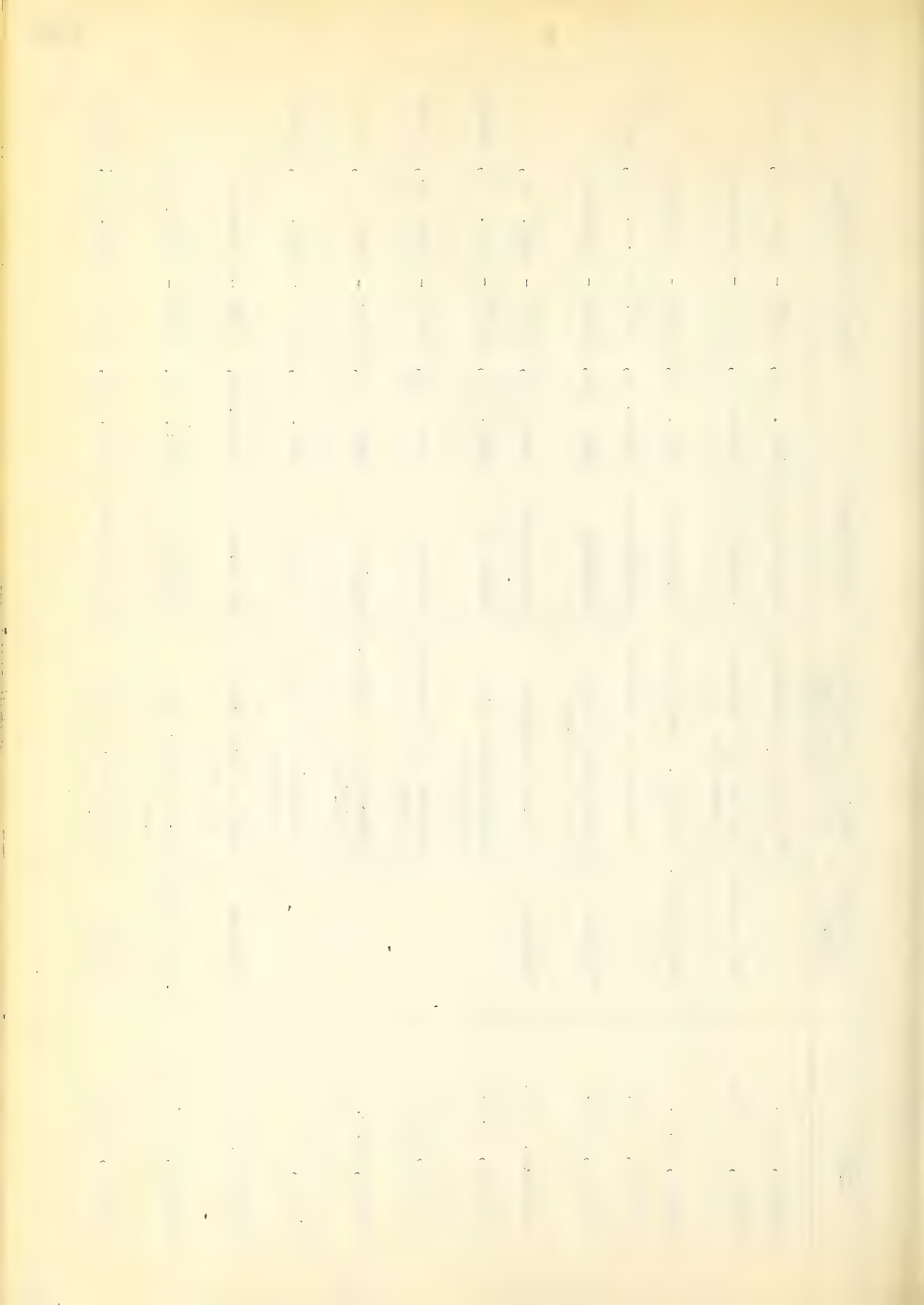
NAME	MILITARY RANK	SPECIAL TRAINING OR EXPERIENCE	DEPARTMENT	TIME AT SCHOOL
Compton, R.O. *	1st Lieut.	Mechanical Engineer. Course at Savage Arms Co.	Head of Gunnery	Aug. 2, 1917 - Closing
Cummings, F.L.	2nd Lieut.	O.T.C.	Military	Feb. 17, 1918 - Closing
Dargue, D.L. *	2nd Lieut.	S.M.A., Toronto	Observation	Sept. 17, 1917 - Closing
Davis, A.G.*	Sergt.	Mechanical Engineer	Engines	June 15, 1917 - Closing
Day, C.P.		Marconi Wireless Institute	Signalling	Mar. 25, 1918 - Aug. 11, 1918.
Day, F.H. *	2nd Lieut.	Mechanical Engineering Student	Signalling	July 23, 1917 - Closing
Deming, H.I.	1st Lieut.	Regular Army	Military	Feb. 11, 1918 - Closing
Dissinger, J.O.	Private	Government Gunnery School	Gunnery	May 24, 1918 - Closing
Dittler, H.*	Private	Instructor, Columbia Univ.	Gunnery	Feb. 16, 1918 - Oct. 23, 1918.
Dobbins, J.A.	Private	Government Gunnery School	Gunnery	May 24, 1918 - Closing
Drieu, A.R. *	2nd Lieut.	S.M.A., Toronto	Airplanes	Sept. 17, 1917 - Closing.
Driscoll, J.T.		Civil Engineer	Airplanes	Dec. 8, 1917 - May 14, 1918.



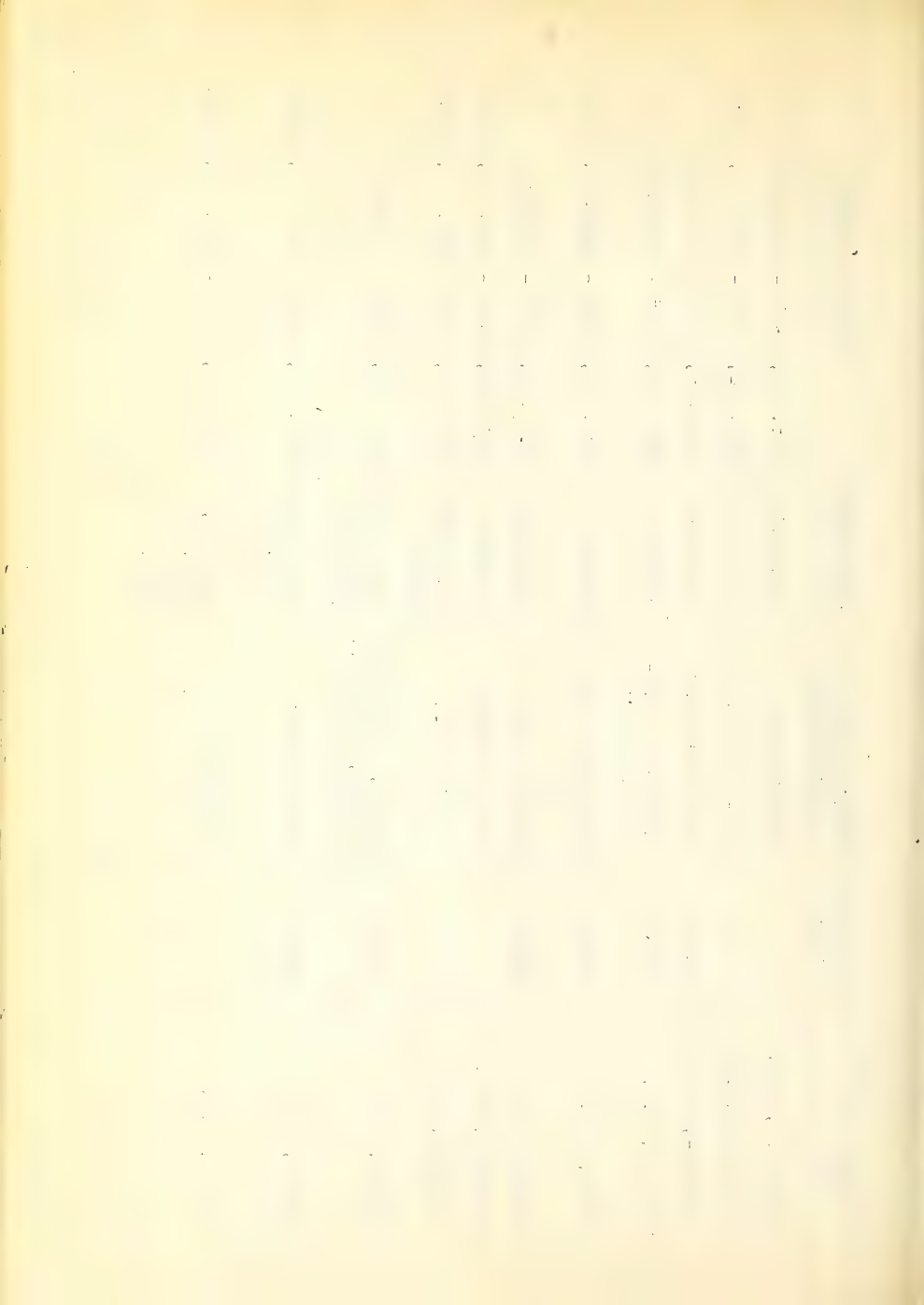
NAME	MILITARY RANK	SPECIAL TRAINING OR EXPERIENCE	DEPARTMENT	TIME AT SCHOOL
Drucquer, H.J.	Private		Gunnery	Nov. 7, 1918 - Closing
Evans, J.R.		S.M.A., Cornell	Observation	Feb. 5, 1918 - Sept. 18, 1918
Fischer, H.J. *	2nd Lieut.	Mechanical Engineering Student	Signals	July 16, 1917 - Mar. 1, 1918.
Flowers, A.E.	1st Lieut.	Regular Army	Military	Nov. 22, 1917 - Closing
Foot, C.L.	2nd Lieut.	S.M.A., Columbus	Military	Sept. 9, 1918 - Closing
Forsythe, H.J.		Thomas-Morse Co.	Airplanes	Sept. 11, 1917 - Jan. 1, 1918.
Fowler, J.W.	1st Lieut.	O.T.C.	Military	Feb. 20, 1918 - Closing
Furnas, A.R.	Private	Mechanical Engineer	Engines	Sept. 24, 1918 - Closing
Guise, C.H.		Master of Forestry	Observation	Dec. 3, 1917 - Closing
Hale, Winfield		Airplane Factory	Engines	June 17, 1918 - Oct 12, 1918.
Hart, E.N.	2nd Lieut.	S.M.A., Columbus	Military	Sept. 28, 1918 - Closing
Hawker, C.F.	Pvt. 1/cl.	Electrical Engineer	Gunnery	Sept. 24, 1918 - Closing
Hayes, B.H.	Private	Government Gunnery School	Gunnery	Mar. 19, 1918 - Closing
Hedstrom, E.A.	Private	Government Gunnery School	Gunnery	May 24, 1918 - Closing

NAME	MILITARY RANK	SPECIAL TRAINING OR EXPERIENCE	DEPARTMENT	TIME AT SCHOOL
Hilmer, E.H.	2nd Lieut.	S.M.A., Atlanta	Military	May 12, 1918 - Closing
Homan, C.L. *	2nd Lieut.	Mechanical Engineering Student	Signalling	July 31, 1917 - Closing
Hoover, E.	Private	Government Gunnery School	Gunnery	May 27, 1918 - Closing
Hoppin, R.C.	Captain	O.T.C.	Senior Military Instructor	Dec. 22, 1917 - Mar. 16, 1918.
Hough, C.C. *	Private	Mechanical Engineer	Engines	Oct. 26, 1917 - Oct. 6, 1918.
Hough, J.	1st Lieut.	Hazelhurst Field	Military	Dec. 10, 1917 - Mar. 9, 1918.
Hunt, C.*	Sergt.	Chemistry Student	Signalling	Oct. 18, 1917 - Closing
Hunt, I.J.	Private	Amateur Wireless	Signalling	July 29, 1918 - Closing
Iglehart, F.N.	Captain	S.M.A., Berkley	Senior Military Instructor	Feb. 25, 1918 - Apr. 30, 1918.
Ivanek, B.B.		Trained at School	Airplanes	July 28, 1917 - Feb. 26, 1918.
James, G. M.		British Army Service Corps	Aerial Observation	May 21, 1917 - Mar. 1, 1918.
Kanka, R.J.		Civil Engineer	Gunnery	Nov. 26, 1917 - Sept. 1, 1918.

NAME	MILITARY RANK	SPECIAL TRAINING OR EXPERIENCE	DEPARTMENT	TIME AT SCHOOL
Maher, J.F.		Wireless Operator	Signalling	Oct. 11, 1917 - June 15, 1918
Mason, Lowell *	1st Lieut.	Course at Savage Arms Co.	Gunnery	Sept. 17, 1917 - Closing
Mason, S.S.	2nd Lieut.	S.M.A., Cambridge	Airplanes	Oct. 2, 1918 - Closing
Masson, J.D.		Trained at school	Airplanes	Sept. 14, 1917 - Jan. 1, 1918
Medley, E.S.	Private	Government Gunnery School	Gunnery	May 24, 1918 - Closing
Merriam, F.F.	Private	S.M.AA Atlanta	Airplanes	June 10, 1918 - Aug. 24, 1918
Miller, D.C.		Mechanical Engineer	Gunnery	Dec. 1, 1917 - Nov. 8, 1918
Miller, S.M.		Course at Savage Arms Co.	Gunnery	Dec. 10, 1917 - Mar. 24, 1918
Mills, C.G.		Scheffield Scientific	Engines	May 6, 1918 - Sept. 1, 1918
Moore, J.H.		Mechanical Engineer	Engines	Dec. 1, 1917 - Nov. 2, 1918
Murback, R.J.	Private	Mechanical Engineer	Engines	Sept. 24, 1918 - Closing
Murray, A.F. *	1st Lieut.	Electrical Engineer	Signalling	Oct. 3, 1918 - Closing
Newell, F.B. *	Private	Mechanical Engineer	Airplanes	Oct. 22, 1917 - Apr. 10, 1918



NAME	MILITARY RANK	SPECIAL TRAINING OR EXPERIENCE	DEPARTMENT	TIME AT SCHOOL
O'Connell, E.C.		Telegrapher	Signalling	Nov. 30, 1917 - Closing
O'Connell, E.M.		Civil Engineer	Gunnery	Dec. 6, 1917 - July 1, 1918
O'Rourke, C.E. *	Sergt.	Civil Engineer	Airplanes	Sept. 18, 1917 - Closing
Osborne, D.B.	Sergt.	Government Gunnery School	Gunnery	May 24, 1918 - Closing
Othus, J.C. *	Sergt.	Mechanical Engineer	Gunnery	Oct. 11, 1917 - Sept. 10, 1918
Parker, P.W.	Sergt.	Regular Army	Airplanes	Sept. 24, 1917 - Closing
Pearsall, E.H.		Auto business	Engines	July 18, 1918 - Aug. 12, 1918
Pentland, H.B.		C.U.R.O.T.C.	Miniature Range	July 6, 1917 - Dec. 1, 1917
Phipps, G.R.	Captain	Major, C.U. R.O. T.C., O.S.C.O., Washington	Senior Military Instructor	May 27, 1918 - Closing
Phipps, J.S.	Captain	Business man	Senior Military Instructor	Nov. 11, 1917 - Dec. 17, 1917
Pierce, C.A.		Professor in Cornell Univ.	Engines, Asst. to Pres. of Acad. Board	June 15, 1917 - Mar. 7, 1918.



NAME	MILITARY RANK	SPECIAL TRAINING OR EXPERIENCE	DEPARTMENT	TIME AT SCHOOL
Pollock, Ross	Corporal	Canadian Army	Gunnery	June 17, 1917 - Oct. 31, 1917
Quinan, P.H.	Sergt.	Hazelhurst Field	Airplanes	May 6, 1918 - Closing
Reining, E.W.	Private	Telegrapher	Signalling	May 21, 1918 - Closing
Reuther, B.O.		Telegrapher	Miniature Range	Dec. 3, 1917 - May 25, 1918
Richardson, C.		Mechanical Engineer	Engines	June 15, 1917 - Sept. 25, 1917
Rogers, G.M. *	2nd Lieut.	Mechanical Engineer	Engines	June 15, 1917 - Closing
Saunders, W.L. *	1st Lieut.	Col. C.U. R.O.T.C.	Asst. to Commandant	May 21, 1917 - Mar. 9, 1918
Sawyer, F.F.	Private	Canadian Army	Gunnery	May 24, 1918 - July 1, 1918
Searles, H.N.		Mechanical Engineer	Gunnery	Oct. 29, 1917 - Jan. 1, 1918
Seely, W.G. *	Private	Teacher	Gunnery	Mar. 15, 1918 - Oct. 8, 1918
Severinghaus, W.C. *	1st Lieut.	Y.M.C.A. Secretary	Military, Mess Officer	Dec. 1, 1917 - Closing
Short, S.E. *	1st Lieut.	Course at Springfield Arsenal and Ellington Field	Gunnery	Aug. 25, 1917 - Aug. 26, 1918

NAME	MILITARY RANK	SPECIAL TRAINING OR EXPERIENCE	DEPARTMENT	TIME AT SCHOOL
Kirkeby, C.D.	Private	Regular Army	Gunnery	July 1917 - Sept. 27, 1917.
Kratky, A.H.	2nd Lieut.	Military Aviator	Gunnery	Nov. 12, 1918 - Closing
Krech, K.G. *	2nd Lieut.	Commercial Radio Operator	Miniature Range	July 17, 1917 - Closing
Kurz, E.W.		Civil Engineer	Airplanes	Dec. 8, 1917 - Nov. 2, 1918.
Lamb, E.G.	Private	Government Gunnery School	Gunnery	May 24, 1918 - Closing
de Lancy, E.F.		Trained at S chool	Airplanes	Aug. 22, 1917 - Sept. 30, 1917.
Lasell, H.S.	1st Lieut.	O.T.C.	Military	Nov. 19, 1917 - Oct. 30, 1917.
Lautz, T.V.		Trained at School	Airplanes	Aug. 14, 1917 - Oct. 1, 1917.
Lewis, H.F.	Private	Civil Engineer	Gunnery	Jan. 21, 1918 - Oct. 8, 1918.
Lundgren, F.	1st Lieut.	Military Aviator	Airplanes	Dec. 22, 1917 - Apr. 12, 1918.
McCarthy, E.	2nd Lieut.	S.M.A., Atlanta	Military	Aug. 12, 1918 - Closing
McCoy, D.C.	1st Lieut.	Mechanical Engineer	Drill & Signalling	June 27, 1917 - Sept. 1, 1917.
McGowan, H.V.		Capt. C.U. R.O.T.C.	Military	Aug. 1, 1917 - Nov. 22, 1917.
McVetty, P.G.	1st Lieut.	Mechanical Engineer	Engines	June 11, 1917 - Closing

NAME	MILITARY RANK	SPECIAL TRAINING OR EXPERIENCE	DEPARTMENT	TIME AT SCHOOL
Simons, L.M.	2nd Lieut.	S.M.A. for Adjutants	Military	Sept. 22, 1918 - Nov. 2, 1918
Slimm, J.B. *	1st Lieut.	Major, C.U. R.O. T.C.	Military	June 11, 1917 - Closing
Smith, H.H.		Trained at school	Airplanes	Aug. 1, 1917 - Sept. 30, 1917
Smith, R.A.		Curtiss Co.	Airplanes	Aug. 16, 1917 - Sept. 30, 1917
Stainton, W.H. *	2nd Lieut.	Mechanical Engineering Student	Miniature Range	Sept. 14, 1917 - Closing
Stanton, D.T. *	1st Lieut.	Capt. C.U. R.O. T.C.	Military	Oct. 29, 1917 - Closing
Strong, H.M.		Mechanical Engineer	Engines	Jan. 7, 1918 - Closing
Stunoch, W.		Mechanical Engineer	Gunnery	Nov. 20, 1917 - Jan. 11, 1918
Tallman, M.H. *	Private	Trained at school	Gunnery	Jan. 28, 1918 - Closing
Taylor, J.L.	Sergt.	Structural Iron Worker	Airplanes	Sept. 29, 1918 - Closing
Tetreau, O.L.	Private	Government Gun-nery School	Gunnery	May 24, 1918 - Closing
Thornburg, J.L.	Private	Government Gun-nery School	Gunnery	May 24, 1918 - Closing

NAME	MILITARY RANK	SPECIAL TRAINING OR EXPERIENCE	DEPARTMENT	TIME AT SCHOOL
Tilley, N.N. *	Private	Mechanical Engineering	Engines	Sept. 18, 1917 - Mar. 30, 1918
Tuttle, M.H. *	Private	Mechanical Engineering Student	Engines, Asst. to Pres. of Acad. Board	Nov. 26, 1917 - Closing
Van Horson, J.M.	2nd Lieut.		Military	May 27, 1918 - July 8, 1918
Volkhart, A.N. *	2nd Lieut.	Capt. C.U. R.O. T.C.	Military Studies	July 16, 1917 - Oct. 31, 1918
Wadsworth, A.G.		Telegrapher	Signalling	Dec. 5, 1917 - Sept. 1, 1918
Ward, C.P.		Trained at school	Gunnery	Nov. 27, 1917 - Feb. 15, 1918
Whiteside, C.J.		S.M.A. Ithaca	Observation	Mar. 26, 1918 - Sept. 18, 1918
Wolfe, J.N.	1st Lieut.	Regular Army	Military	Jan. 21, 1918 - Closing
Zimmerman, C.D.*	Sergt.	Mechanical Engineering	Airplanes	Oct. 12, 1917 - Oct. 18, 1918



ADMINISTRATIVE, INSTRUCTING AND CLERICAL STAFF - MAY 9, 1918.





ADMINISTRATIVE, INSTRUCTING AND CLERICAL STAFF - MAY 9, 1918.





STATUS OF INSTRUCTORS.

When the school started there were no commissioned or enlisted instructors. The Commandant issued an order that all instructors would receive from cadets the same position, obedience, and consideration accorded officers. This did not include saluting in general, although a cadet was required to salute an instructor when addressing him outside of the class room.

At this time some of the instructors, especially those in the military department were in uniform, with leather puttees, officer's puttees, and the Signal Corps crossed flags.

When it was found that there would be few, if any, commissions for the instructors and that the only way to hold the men who were drafted was to put them in the lowest grade, private, this created an embarrassing situation from the very start. The cadets receiving instruction from these men were rated as first class privates, and while most of them were of the type of men who could overlook the difference, some of them made it unpleasant for the instructors at times. The instructors were even arrested in the town occasionally by the M. P. for not having passes.

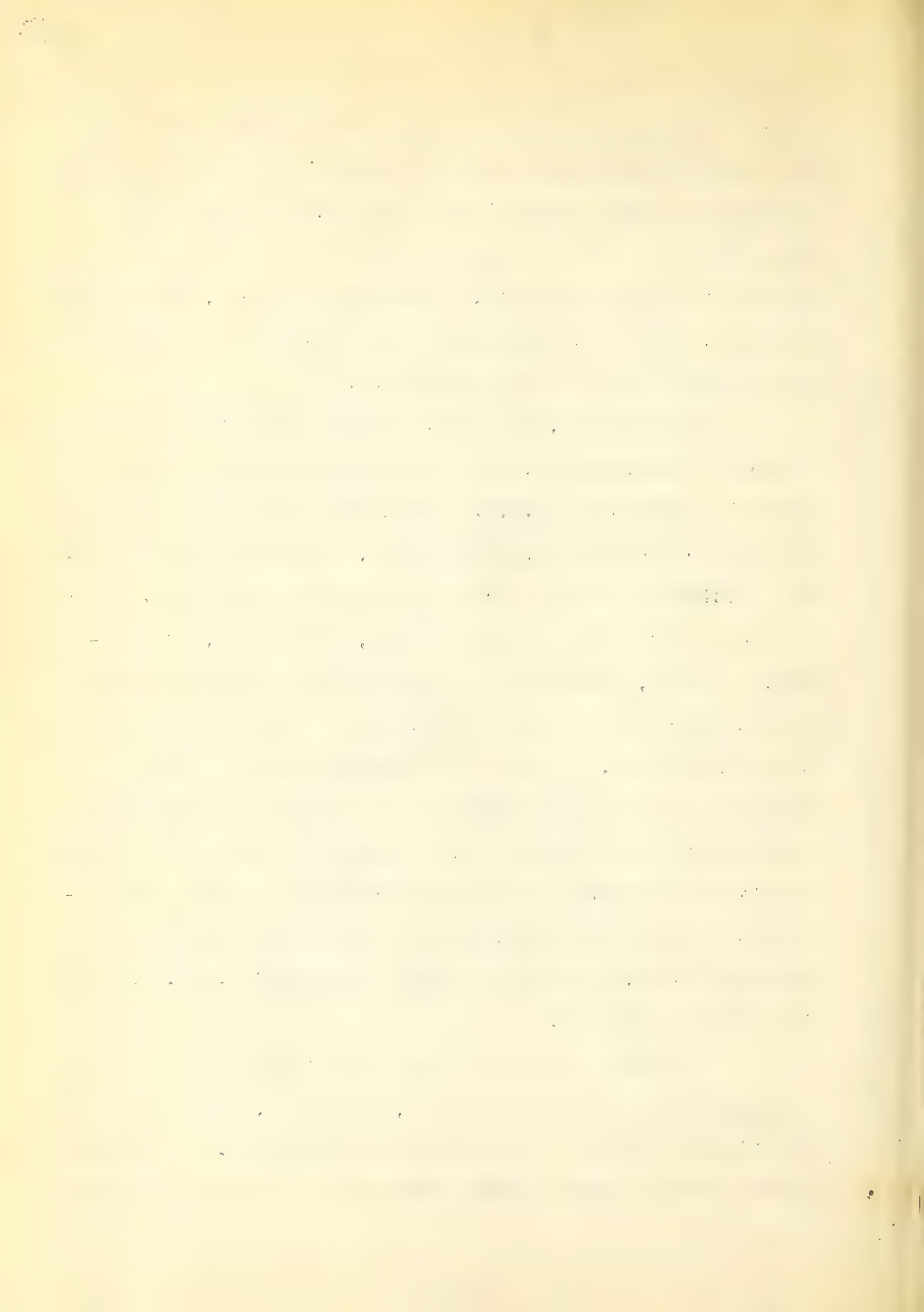
In the spring of 1918 the situation was relieved somewhat by promoting a few of the men to corporals and sergeants.

Orders were received requiring the enlisted instructors to drill, and on March 27, 1918 a faculty

company was organized under one of the civilian instructors who had had considerable military experience and who had been discharged from Officers' Training Camp on account of physical disability. All members of the company who had had no military experience, including civilians, commissioned officers, and all enlisted men were formed in one company and drilled twice a week for an hour.

On August 7, 1918 this company was discontinued and a company consisting of all of the enlisted men on the post (Detachment 814 D.A.S.) was formed under one of the officers of the Military Department, to drill twice a week. For a while no officer had this detachment regularly. The detachment consisted of instructors, sergeants, quartermaster clerks, and others. The enlisted instructors had been allowed to live out of barracks in order to increase their efficiency. One of the officers greatly injured the spirit of the teaching staff on one occasion by severely criticizing the detachment and then ordering them to live in barracks and other punishment for some moral expense of one of the quartermasters. An officer was shortly detailed to have permanent charge of the 814 D.A.S. and an improvement resulted.

A number of new officers were detailed to the post in August and September who were, of course, unfamiliar with the status of some of the enlisted instructors. In nearly every instance these instructors were men who would have been



to training camp and the pool boys assisting in the
missioned but they were prevailed upon to stay here and ac-
cept induction because of the difficulty in filling their
places. They were men of standing in this community, of
exceptional education, technical experience and patriotism,
and the ~~lack~~ ^{presumed} of consideration and harsh treatment they re-
ceived at the hands of some of these officers quickly re-
duced the esprit de corps which Professor Barnard had
built up so painstakingly.

Friction and ill feeling among the civilian instructors ~~was not a new phenomenon~~
~~of the 1910s~~ but matters to a crisis in *and the Commandant*
September 1918, when Professor Barnard addressed a meeting
of the officers upon the subject. He outlined the situation
and explained the cause of the difficulty and the status
of these men carefully.

An immediate improvement resulted and that, combined with the promise from Washington of some commissions, revived the spirit of the instructors to a great extent.

The situation may be better appreciated if it is kept in mind that many of these men had been doing their work well for nearly a year - work that easily became monotonous because it was repeated week after week. Being instructors, making reports on the men, and having more or less the status of officers in their responsibilities they keenly

felt the slights of unthinking officers, such as being made to wait in line with cadets when they wanted to speak to the officers, having to wait after teaching hours till the cadets were paid before receiving their money, and then having an hour's drill after a heavy day of teaching - which is far more fatiguing than most other work. And yet in spite of this the work of the graduates of this school testifies to the fact that the efficiency of the instructors was kept up to the top notch till the very last.

VACATIONS.

A vacation allowance of four weeks per year was granted to the civilian instructors and arrangements were made for giving enlisted and commissioned instructors the same allowance in ten day periods. (This latter arrangement was made in accordance with a Bulletin from the Officer in Charge of Ground Schools, "Under the provisions of Army Regulations and instructions from Adjutant General's Office it is not permitted to issue leaves of absence to officers for periods longer than ten days at a time and then only in cases of emergency. It is believed, however, by this office that a rule such as this should be liberally interpreted by the Commandants at the schools on account of the fact that officers who are engaged in instructional work, repeating the same lecture week after week, certainly need a little time off now and then. The benefits of such procedure undoubtedly accrue both to student and instructors")

ORGANIZATION OF THE INSTRUCTIONAL STAFF

The organization of the instructional staff, exclusive of the Military Department was

under the President of the Academic Board. He employed new men and made such changes in the staff as he found necessary from time to time.

Each department or "Examination Group" came under a head of department chosen by the President of the Academic Board. The Engine Department had two assistants who alternated as head of laboratory instruction. In the laboratory each instructor supervised the work on two engines.

The "Airplanes" Department had an assistant head in charge of laboratory. This man was a Cornell graduate who had worked for the Curtiss Company in Buffalo to prepare himself specially for this work.

The Gunnery Department had two assistants heads of department, one in charge of the Marlin Laboratory and one in charge of the Lewis Laboratory.

In "Observation" an assistant had charge of the Miniature Range and "Cooperation with Artillery". The Department had from two to five instructors for miniature range operators and two lecturers besides the department head for "Map Reading" and "Navigation".

The Signalling Department had a "chief" instructor and an assistant chief instructor who supervised the work of three or more instructors, each in charge of about fifteen cadets.

The Military Department was under the direction of a "Senior Military Instructor", and the Military Studies, (Paper Work, Courts Martial, Organization, etc.) was under the "Head of Military Studies".

Military rank was not considered in the Academic Department. In some departments officers and cadets were subordinate to civilian department heads, and in some cases second lieutenants in charge of departments had first lieutenants under them. There was never any friction from this arrangement.

Engines

The instruction in/under

LECTURES ON MECHANICS

by Professor W. O. Williams began

with lectures. The names and

functions of important parts of motors, explanation of "cycles",

cooling and oiling, adjustment and maintenance, types of

motors, and "trouble shooting" were taken up systematically

as the student advanced. The lectures were illustrated

with large scale parts of parts and types of motors, showing

cyclic changes, carburetion, ignition, oiling etc., and with

engine parts and models of construction and operation. In the

laboratory the cadets worked in small groups, of ten or twelve

under the immediate supervision of an instructor. Each

group worked on the disassembling and assembling of two different

types of motors. The laboratory was also equipped

with facilities for drawing and modeling of engine parts.

Structure and operation were emphasized and discussed in

small groups under an instructor who led a discussion on them.

In the first part the cadets were taught to start and to operate motors, to tell whether cooling systems were functioning, and if overheating the cause, and to find the causes of misfiring, stopping, and irregular running.

In the laboratory the work was scheduled in such sequence that upon reporting the cadets found the engines in the same condition in which they were left at the end of the preceding period.

The "Airplanes" course under Professor Ernest Blaker began with lectures with slides, wall charts, small wings, and air blasts, on the principles of flight. The work in the laboratory began with a lecture on nomenclature with the cadets assembled about stripped airplanes. It was then continued by small groups under an instructor for each group, to the assembling, rigging, and alignment of a ship. Short lectures on fuselage alignment, propellers, woods and other structural material, iron, and wire were given in the laboratory. The cadets were given practical experience in longeron and wire splicing and in wing covering and repairing. Lectures were given on "Types of Airplanes" including visual characteristics aiding in quick identification. An inspection of a ship - both general and flying - completed the work. Lectures in meteorology were given concurrently.

In January, Lt. W. C. Compton began with a lecture on the gun in general and the remainder of the work was done in the laboratory. Eight to ten cadets seated around tripods with an instructor for each tripod, first learned the names of the parts of the guns, the principles of gas operation, the functions of the various parts and groups of parts. Each cadet was carefully instructed in stripping and assembling the gun, stoppages and jams, and practiced in magazine drill. Work was given with wing sights and wind-vane foresights.

For a while the machine gun range was used, the cadets firing ten shots for grouping and having practice in finding and correcting "set-up" stoppages. The rest of the machine gun range was now discontinued in accordance with orders from the Government. On the trap range the cadets were instructed to shoot with ring sights on their shotguns.

√ The work in Observation under Professor L. A. Lawrence began with lectures on Map Reading with large wall charts for illustrating contours, profiles, etc. To supplement the lectures on scales, orientation, and contours the cadets were taken on walks around the country, each man being provided with a large scale map of the area. Enlargements of maps showing the British and French systems of pin pointing to scale of 1/2500 were used. In Navigation the

principles were outlined in lectures and laboratories were arranged where the men received practice in the use of protractors and scales. The work was completed on the miniature ranges and rotary map by having the cadets estimate distances and directions, and work out problems in Navigation involving the corrections for wind and compass errors, speed and time of flight, and distances. The Co-operation with Artillery work was taken care of in lectures which outlined the systems, codes, and purposes of Aerial Observation. This work was supplemented on the miniature ranges with practice in pin pointing, prearranged and impromptu shoots, etc., the men acting both as aviators and ground officers.

The work of the Signalling Department under Lt. E. P. Day was for the most part simply practice in sending and receiving. An introductory lecture was given and then the instructors took charge of small groups. The men sent to instructors individually and the instructors sent to whole groups. Sending was taught with silent keys and receiving by the sound method instead of by dots and dashes. Buzzers were arranged to sound in head receivers. The keys were similar to those used in airplanes large knobs and no elbow rests. Morse inkers were used for instruction and examinations in sending. A few hours practice were given with the men sitting in models of fuselages, and a few hours in panoramic and direct receiving.

The military subjects, such as Infantry, Courts Martial, and Organization, were given in lectures. Infantry Drill and Ceremonies, Bayonet Practice, Gas Mask Work, etc., were given in the field under experienced drill masters. Instruction and practice in guard duty were supplemented by having a guard on the building from 4 P.M. till 7:30 A.M., except Saturdays and Sundays when the guard was on all day. All officers at the post took turns as "Officer of the Day", by roster.

Memoranda and special instructions from Washington from time to time caused slight changes to be made in the instruction. Instructional sheets such as conventional signs, flag rules, etc., were given the cadets by different departments.

Discussion continued on page 196.

SAMPLES OF EXAMINATION PAPERS

UNITED STATES ARMY
SCHOOL OF MILITARY AERONAUTICS
AT CORNELL UNIVERSITY, ITHACA, N.Y.

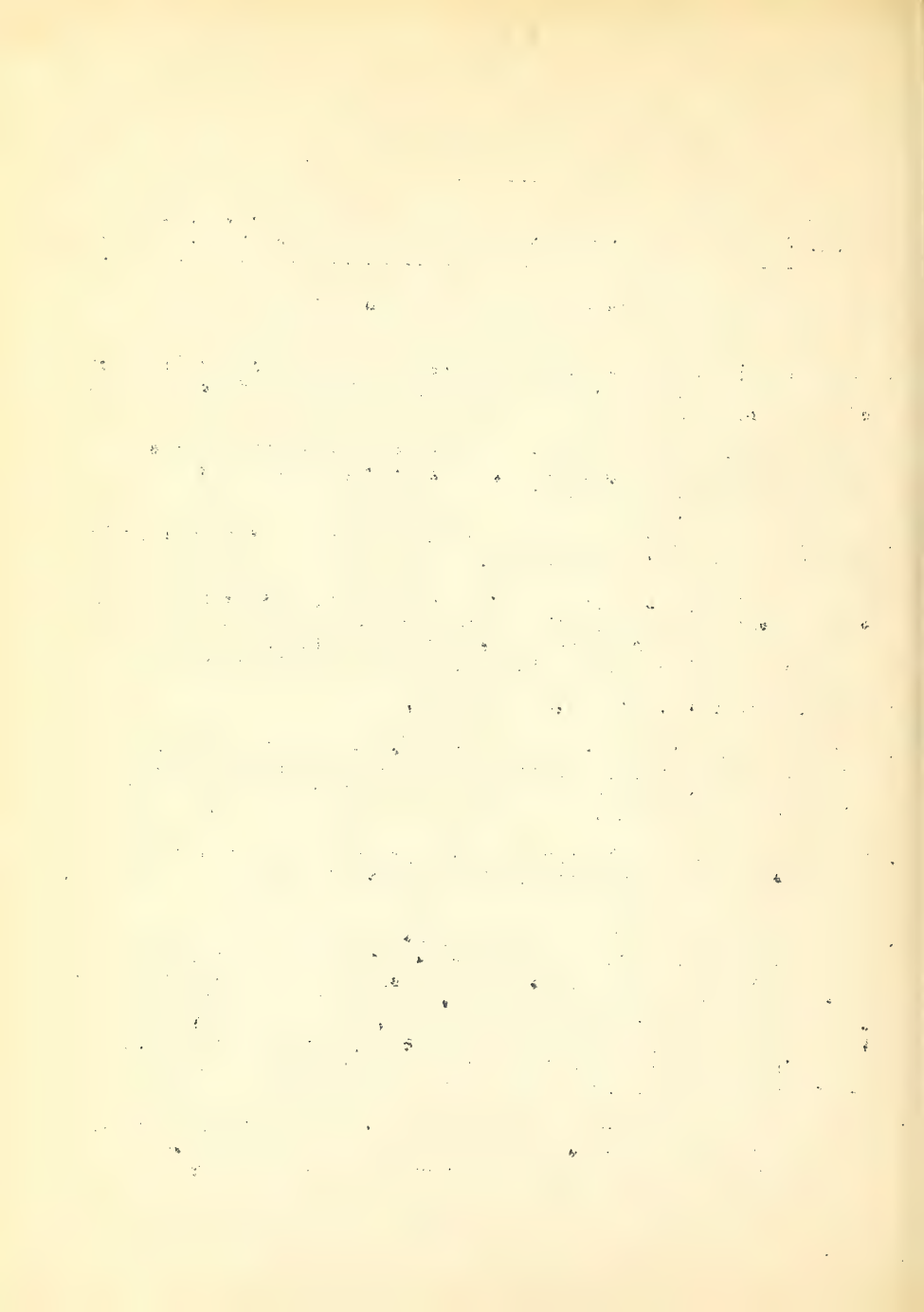
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FINAL EXAMINATION
OBSERVATION

SQUADRON "M"

Sept. 2, 1918.
CLASS OF Sept. 7, 1918.

1. a) What is the 100% zone? b) Of what importance is it in artillery work?
2. What are the duties of aero squadrons assigned to (a) Divisional artillery, (b) Army corps Artillery, (c) General in Command of Army Corps Artillery?
3. What is a zone map? (b) How is this used for allotment of artillery along a front and for cooperation between the artillery and the airplane?
4. Give the pin-points of the following churches: at Vlamertinghe, at Elverdinghe, at Reninghelst.
5. Using the variation given on the map and deviation table given on the board, what will the compass courses be from:
 - (a) The church at Miekebusch to church at Vlamertinghe
 - (b) From church at Vlamertinghe to church at Elverdinghe
6. Explain how a deviation table is made.
7. Give the conventional signs for the following: (1) Adjutant General, (2) Sentry, (3) Battle, (4) Palisades, (5) Barbed wire fence, (6) Truss Bridge, (7) Church, (8) Orchard, (9) RR in cut, (10) Grass meadow land.
8. The course you wish to fly is 150 degrees. There is a 30 miles wind blowing from the north. The speed of the machine is 90 M.P.H. Find the corrected map course.
9. a) If the scale is 5 cm. = 1 km. how many miles separate A and B if they are 64 inches apart on the map? (b) The scale is 1 inch = 8 miles. How many kilometers ~~sepa~~ separate A and B if they are 25 centimeters apart on the map? (c) The scale of a map is 1/15000. X is 15 inches from Y. On another map of the same country X is 3 inches from Y. What is its R.F.? (d) If the scale is 1/20000 how large on the map in inches would you want a field to land in?
10. (a) Draw a sketch showing two streams joining, a hill between, gently sloping ground on the right and rough steep slopes on the other side. (b) How can you tell a valley from a ridge by the contours?



UNITED STATES ARMY
SCHOOL OF MILITARY AERONAUTICS
AT CORNELL UNIVERSITY, ITHACA, N.Y.
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FINAL EXAMINATION , AUGUST 19, 1918.
OBSERVATION SQUADRON "M" CLASS OF AUGUST 24, 1918.

1. a)What are the six types of shells most used in artillery work?
b)What types of fuses are used with these?
2. a)What types of ordnance are included in Divisional Artillery?
b)Explain, using a diagram, the organization of the French Divisional artillery and its allotment to zones.
3. a)How is a counter battery program made up?
b)What three things must be remembered in making up such a program?
4. a)What are contours? b)What does the spacing of contours show?
c)How can you tell a valley from a ridge by the contours?
5. a)Describe two ways of orienting a map? b)If you come out of a cloud suddenly how can you tell what village you are over?
c)What are the first things to look for on a new map?
6. You are ordered to make a reconnaissance, starting from the church in Dickebusch and going to the church in Renninghelst, then to the Busseboom Crossroads, and then back to the starting point. The speed of your plane is 100 miles per hour. There is a constant wind from the Southwest with a velocity of 25 miles per hour. Make a neatly arranged table giving the following information for each line: Map Course, Corrected Map Course, Magnetic Course, Compass Course, length in kilometers, time of flight in minutes. Use the deviation table on the board.
(Counts 50)

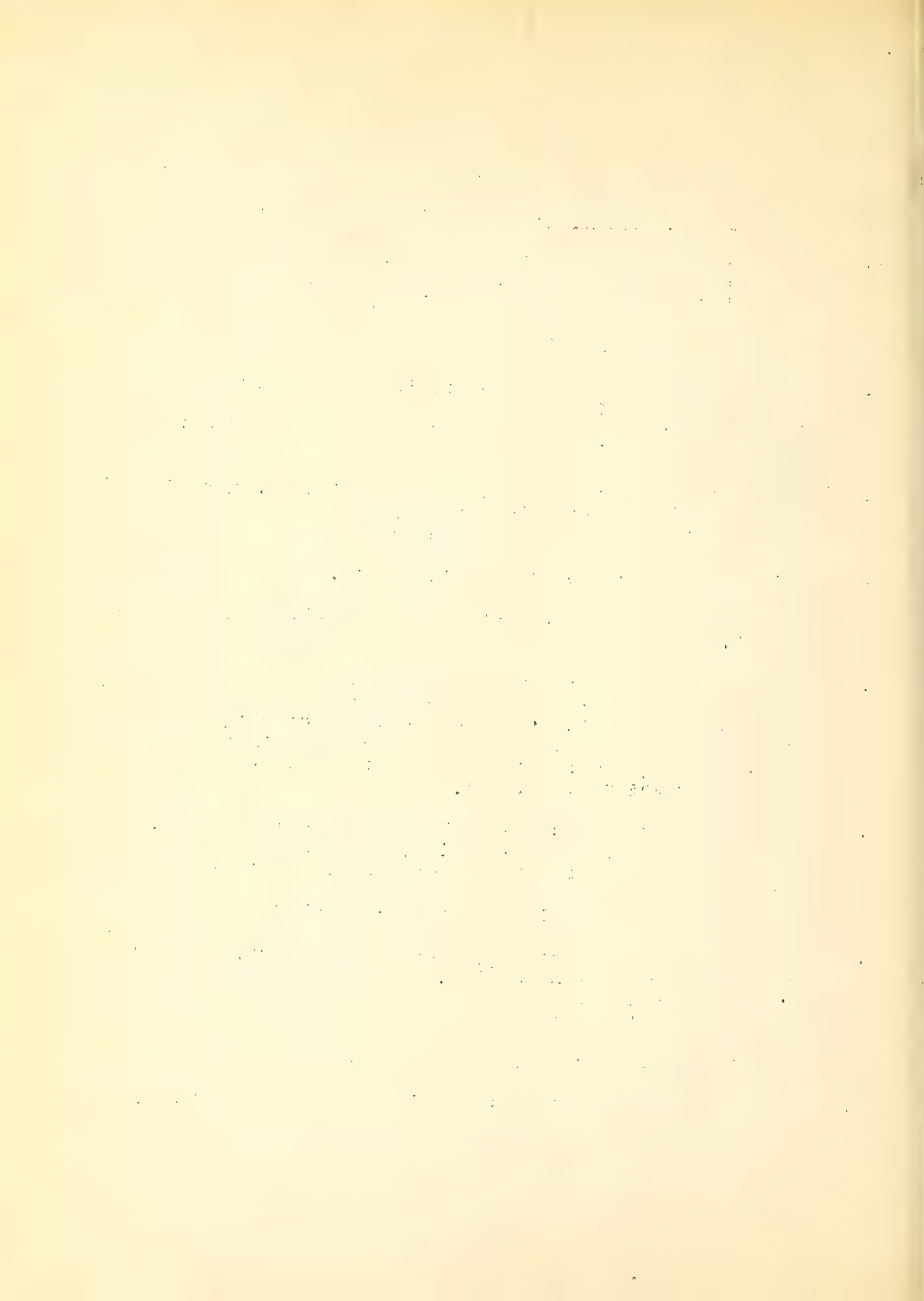
UNITED STATES ARMY
SCHOOL OF MILITARY AERONAUTICS
AT
CORNELL UNIVERSITY
ITHACA NEW YORK

149

FINAL EXAMINATION Squadron L-58 September 19, 1918.

Airplanes Graduation date September 28, 1918.

1. Define: (a) fin, (b) critical angle, (c) aspect ratio, (d) chord,
(e) fineness ratio, (f) sweepback, (g) safety wire,
(h) rudder, (i) leading edge, (j) raking.
2. How is the center panel aligned ? Illustrate.
3. (a) What are the primary essentials of a bombing plane ? How
are they obtained ?
(b) What are the essential features of a speed scout ? How may
these be obtained ?
4. (a) Explain the structural differences between non-flexible,
flexible, and extra-flexible cable.
(b) For what purposes are each used ?
5. How is a longeron repaired ? Illustrate.
6. Give in logical order the steps in assembling and aligning an
airplane.
7. (a) How is the efficiency of a wing indicated ? How does it vary
as the angle of incidence varies ? Why ?
(b) Two wings have the same surface, aspect ratio and angle of
incidence; one has a larger camber and the other a smaller
camber. Compare their lifts and efficiencies.
(c) Define 'lift coefficient'.
8. (a) Explain why washin and washout are sometimes used.
(b) A ship is flying horizontally. Its speed is kept constant
but the angle of incidence is decreased. What will happen ?
Why ?
(c) What are the conditions for best climb ?
9. (a) Define isobar, isotherm, pressure gradient. Give symbols
for clear weather with no wind, Rain with wind from North-
west, Thunderstorms.
(b) What characteristics of a weather map may indicate high
winds ?
(c) What are Air Layers ? How may they be indicated ?
10. Draw a sketch of an altimeter and explain how it works.



UNITED STATES ARMY
SCHOOL OF MILITARY AERONAUTICS
AT
CORNELL UNIVERSITY,
ITHACA, NEW YORK

Final Examination

June 18, 1918.

"Engines"

Squadron "M"

class of June 22, 1918.

1. In an engine, having a water jacketed intake manifold, (a) the water for this jacket is taken from what part of the cooling system? Why? (b) To what part of the cooling system is this water delivered? Why?
2. Explain how to clean a Zenith carburetor, giving the chief precautions to be observed.
3. Of what materials are the following parts usually made:-(a)The connecting rod? Why? (b)Cylinders? Why?
4. Give in order the steps to be followed in timing the magneto, without using the marks on the gear teeth.
5. Explain how to grind a valve properly.
6. What is the purpose of: (a) The safety gap? (b)The magnets?
7. What are the approximate values of the following distances in a magneto ignition system: (a)Spark plug gap? (b)Safety spark gap? (c) Interrupter gap?
8. The distance from A to B is 480 miles. The time required to go from A to B was 4 hours. The gasoline required to go from A to B was 72 gallons. The gasoline weighed 6 lbs. per gallon. The h.p. of the engine was 200. The oil consumption of the engine was .035 lbs. per h.p. hr. Find: (a)Average speed of the plane. (b)Average number of miles per gal. of gasoline. (c)Lbs. of gasoline used per h.p.hr. (d)Lbs.of oil required for the journey.
9. Why do the exhaust gases not enter the crankcase of the monosoupe Gnome when the ports are uncovered on the expansion stroke?
10. Make a sketch showing the cross section of a spark plug, indicating which is the insulating material.
11. What are the troubles that may occur with the water cooling system of airplane motors?
12. Explain how to determine whether or not a spark plug is short circuited in an engine having a single ignition system.
13. How may the intake manifold be tested for a leak?
14. What troubles may arise from overlubrication?

UNITED STATES ARMY
SCHOOL OF MILITARY AERONAUTICS
AT
CORNELL UNIVERSITY
ITHACA, NEW YORK

Final Examination

August 23, 1918.

Subject--Signalling--- Squadron M-- Grad. Date.--August 24, 1918.

Receiving--Buzzer-- Speed = 30 per minute--- 2 minute exam

pq8 47ry5 ghtyr eiujn ghvb cmx7 wq3e4r wq3e4r dftgy huj lmnhb
vfcd xsaze jg56ek

Sending on the Morse Inker-- speed = 40 per minute-- 3minute exam.

2qaz xsw 3 e dc4 fr v5 gtb y6 hn7 u 8jm 9i kmlo9 p0 ki89 olp u7yjm
n 54rtfg vb dscex4 a2q3wz s34edx cr465tf gv yhb nj u8i7 kmi 89
lo98p kt564 esd cfigv bhnj

UNITED STATES ARMY
SCHOOL OF MILITARY AERONAUTICS
AT
CORNELL UNIVERSITY
ITHACA, NEW YORK

Final Exam

Time: Two Hours

Nov. 8. 1918.

Subject: Gunnery

Squadron M - 64 Grad. Date Nov. 9, 1918.

LEWIS GUN

- I Mech. (10) (a) Give "Action of Bolt and Extraction."
(b) Tell the function performed by every feature of the feed operating arm during the forward movement.
- II Desc. (10) (a) Describe the guard of the American Lewis gun.
(b) Describe four pawls found on the British model Lewis.
- III Desc. (5) Give two parts of the gun that actuate each of the following:
(a) Rebound pawl;
(b) Stop pawl;
(c) Ejector;
(d) Sear;
(e) Gear stop.
- IV Stop. (5) (a) Explain how a separated case may result in a stoppage of a jam.
(b) Describe each step you would take from the time your gun stops until a jam due to a broken cartridge guide has been verified.

GENERAL

- V Care (5)(a) After a flight in which 400 rounds have been fired, your barrel is found to have metal fouling deposit. Tell how you would clean the barrel under the circumstances.
- (b) Name parts of the Marlin that should be oiled after cleaning.
- VI CC GEAR (5) Describe the filling of the C.C. gear with oil.
- VII Sights (10)(a) Exactly how would you position the enemy plane as regards the ring backsight of your fixed gun if he were flying at 30 degrees to your path and at a speed of 1 1/2 that for which the sight is designed. Give reason for statements using sketch if desired.
- (b) Explain how the windvane foresight corrects for speed of your plane regardless of position of gun.

DATE, 8 NOV 1964
DATE, 9 NOV 1964

[illegible]

SECRET
ALL INFORMATION CONTAINED HEREIN IS UNCLASSIFIED
DATE 01-11-2001 BY 60322 UCBAW/BJS/STP

THE STATE OF NEW YORK, ss. I, _____, County Clerk, do hereby certify that the within and foregoing is a true and correct copy of the original as the same appears from the records of the County of _____.

1. The first group of people who were arrested were the members of the "Black Panther Party" who were active in the civil rights movement. They were arrested in 1968 and 1969.

UNITED STATES ARMY
SCHOOL OF MILITARY AERONAUTICS
AT
CORNELL UNIVERSITY
ITHACA, NEW YORK

Final Exam

Time: Two Hours

Nov. 8, 1918.

Subject: Gunnery

Squadron M - 64

Grad. Date Nov. 9, 1918

MARLIN GUN

- III Desc. (10) Give the name, location, and function of -
 (a) the principal features of the barrel;
 (b) the gas cylinder.
- X Mech. (10) (a) Give the action of the carrier.
 (b) Just where is the second round to be fired when the empty shell is being ejected ?
- I Mech. (10) (a) Explain the action of the moving parts of the lock container.
 (b) Give the action of "Firing of the First Shot."
- II Stop. (10) Just what will happen if -
 (a) the trigger spring broke;
 (b) the feed lever were improperly assembled;
 (c) the firing pin broke;
 (d) the sear-trigger pin latch were unlatched;
 (e) a primer were defective ?

XII Practical

(10)

Sign the Statement.

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1981

Value

INFANTRY DRILL

1. (a) Explain fully the movement, Squads right, March. 3
(b) Describe the position of Parade rest. 2
2. (a) What is the position of the First Sergeant when the Company is in line, and what does he do when directed to dismiss the Company, and what are his commands ?
(b) State when the fixed pivot is used, when the moving pivot is used.

INTERIOR GUARD DUTY.

3. (a) Give a diagram of a relief showing the post of new and old Corporals. New Relief marching out. Old Relief marching in. 2
(b) Give diagram posting a sentinel, showing the position of old and new Corporals. 2
4. (a) You are Sergeant of the Guard and the Corporal on watch informs you that the sentinel on Post No. 7 has called Fire. 2
QUESTION: What action do you take ?

FIRST AID, HYGIENE & SANITATION

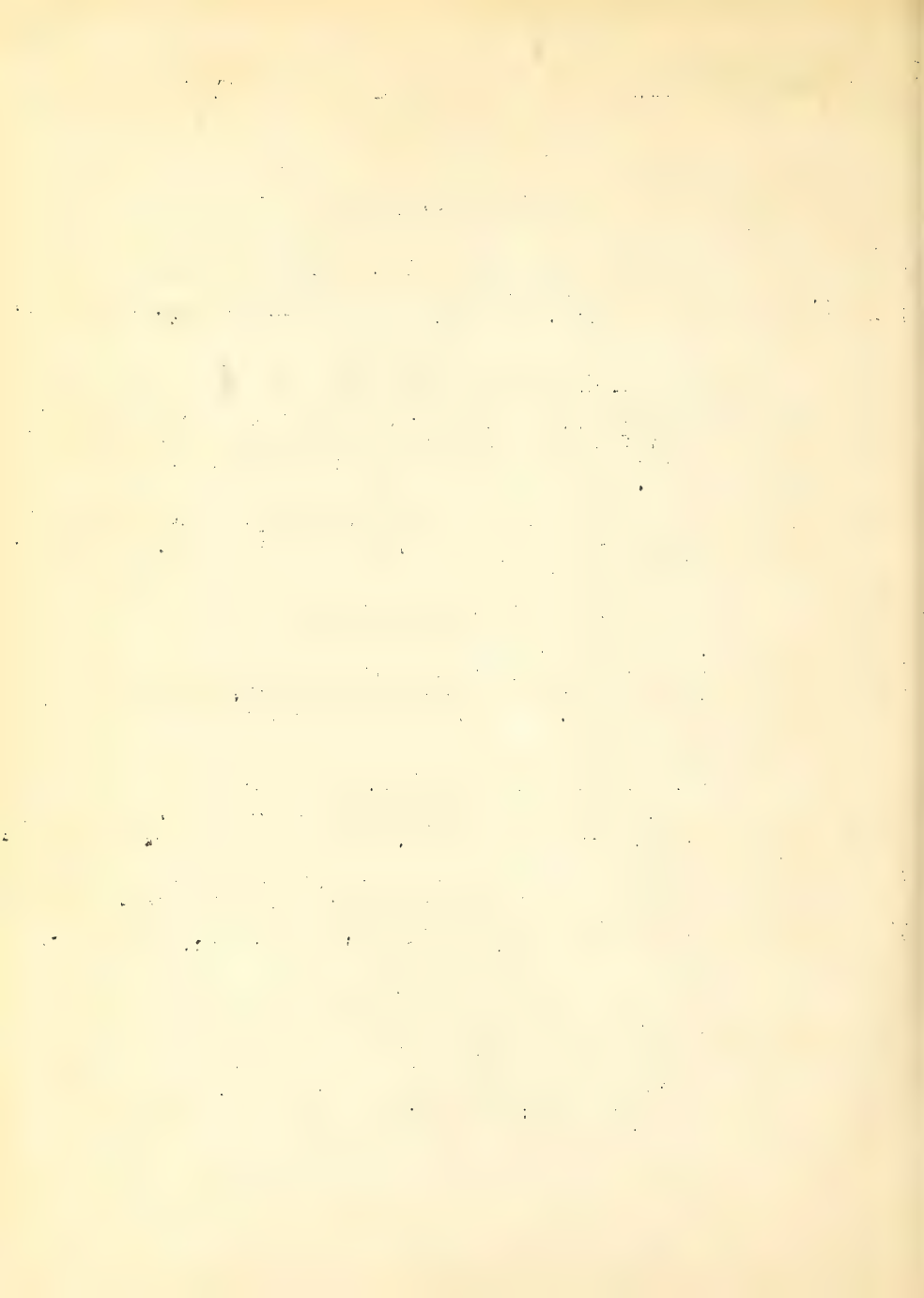
5. (a) What is meant by First Aid? 1
(b) What is the contents of a First Aid Packet ? 1
(c) State three important points in caring for health. 3
(d) What are some of the duties of the sanitary officer and why are they important ? 2

ADMINISTRATION & ORGANIZATION U.S. ARMY

6. (a) State three specific duties of each of the following Air Service Squadrons. Observation Squadron. Bombardment Squadron. Pursuit Squadron. 2
(b) In what three ways may an Observation Squadron be employed ? 2
(c) Give number of observers and what is the ratio, with reference to Artillery, Infantry, and Staff. 3
(d) State the duties of the Adjutant General's Department. 4

DISCIPLINE & COURTESY

7. (a) What is discipline and what is its object ? 3
(b) Explain the importance of military courtesy. 3
(c) You are sending an orderly to a subordinate officer with a message for him to report to you at once. QUESTION: What instructions (give wording) will you give the orderly and what will the orderly do after delivering the message ? 4



FINAL EXAMINATION

SUBJECT : MILITARY STUDIES

SQUADRON F- 72

NOVEMBER 22, 1942

ARMY REGULATIONS & PAPERWORK

8. (a) From what is a Squadron Fund derived ?
 (b) Who comprises the Squadron Council ?
 (c) How often does the Squadron Council meet and what are its duties ?
 (d) Who may disburse money belonging to the Squadron Fund and what authority is necessary for its disbursement ?
 (e) How is the Squadron Fund transferred from one officer to another ?
9. How is unserviceable property classified, with reference to its disposition ?
10. What authorities may authorize the discharge of an enlisted man before the expiration of his term of enlistment ?
11. (a) Explain the purpose of the Individual Equipment Record.
 (b) What disposition is made of the Individual Equipment Record when an enlisted man is transferred ?
12. (a) What data is contained in the Morning Report ?
 (b) Who prepares the Morning Report and what signature and initials are required to complete it ?
13. (a) You are a non-commissioned officer in 645th Aero Squadron ordered transferred to the 678th Aero Squadron at the same station. QUESTION: Who would be the authority competent to order your transfer?
 (b) If you were to be transferred retaining your present rank what must be stated in the order transferring you ?
14. (a) What is meant by a voluntary allotment ?
 (b) What is meant by a compulsory allotment ?
 (c) Under what conditions may an officer allot part of his pay to his family ?
15. You are appointed Survey Officer to survey a damaged aeroplane. State briefly your duties as an officer acting in that capacity.
16. In the case of a discharged soldier what disposition is made of the following records: Service Record, Individual Equipment Record. Pay Card.

THE ADMINISTRATION

The Commandant was the government representative at the school. He was responsible for the policy of the school and the judge as to whether the University was living up to its contract. All of the correspondence with Washington was thru his office, whether originating in the Military Department or in the office of the President of the Academic Board. He was assisted by a Post Adjutant, an assistant Post Adjutant, a Personnel Adjutant, and a large staff of civilian and enlisted clerks and accountants.

The Quartermaster and Supply Officer had charge of all issuance of equipment and transportation and all disbursements. He reported directly to the Commandant.

The President of the Academic Board had charge of all instruction except in the Military Department, purchase of all supplies not furnished by the government, all construction in and about the Drill Hall, employment of civilians, turning back of cadets for failures in academic work, and all other matters pertaining to the Academic Work of the school. He reported to the Ground Schools Branch of the Training Division thru the Commandant. He was assisted in matters such as preparation of schedules, promotion of instructors, turning back of cadets, and

matters of policy by the Academic Board. He was assisted in matters such as room schedules, plans for new construction, and supplies by an Assistant to the President of the Academic Board, who was not a member of the Board.

The Senior Military Instructor was in charge of all military instruction and discipline. He reported directly to the Commandant. He was assisted by a Regimental Adjutant. During the last few months the theoretical subjects were grouped and formed a department under the head of "Military Studies."

Major Howard C. Davidson, A.S.S.C. was Commandant of the School from the beginning till October 2, 1917. (He came to the school as 1st Lieutenant, and received his promotion to Major while here.) He was succeeded by Major D.M. Cheston Jr., A.S.S.C. who continued in command till August 22, 1918. Lt. Col. George R. Harrison, A.S.A. assumed command on Sept. 1, 1918 and continued in command till the closing of the school.

Major Harral Mulliken, A.S.A. took charge of the Quartermaster's Office on October 9, 1917, and continued in that position till the School was closed. He acted as Commandant between the time Major Cheston left and Lt. Col. Harrison arrived. He received his promotion to Major while at the school.

Professor W. N. Barnard of the Department of Power Engineering of the College of Mechanical Engineering, Cornell University, held the position of President of the

Academic Board from the time of the establishment of the Board until the closing of the school. The Academic Board consisted during the entire period of Professors F.O. Ellenwood, Ernest Blaker and L.A. Lawrence of Cornell University.

1st Lt. W. F. Bull, A.S., S.R.C. was in charge of Military Instruction until Nov. 7, 1917, when he was transferred to Ohio State University. A man of no military experience whatever arrived on Nov. 11, 1917 to be Senior Military Instructor. He held the position, with the assistance of the lieutenants under him, till Dec. 17, 1917, when he was relieved by Captain Bayard C. Hoppin, A.S., S.R.C. Captain Francis N. Iglehart, A.S.S.C. took charge on Feb. 25, 1918 and during his stay until April 29, 1918, materially improved the discipline and smartness of the cadet corps. 1st Lt. H.L. Deming, A.S.S.C. acted as Senior Military Instructor until May 27, 1918, when Captain George R. Phipps, A.S.S.C. arrived. He continued in the position till the closing of the school.

The frequent change in personnel of the Military Department and the inefficiency of many of the commissioned officers sent to the school in the early days was detrimental to the efficiency of instruction in this department.

A disciplinary office under the charge of a com-

missioned officer handled matters pertaining to breaches of rules and regulations until Captain Iglehart took charge of the Military Department.

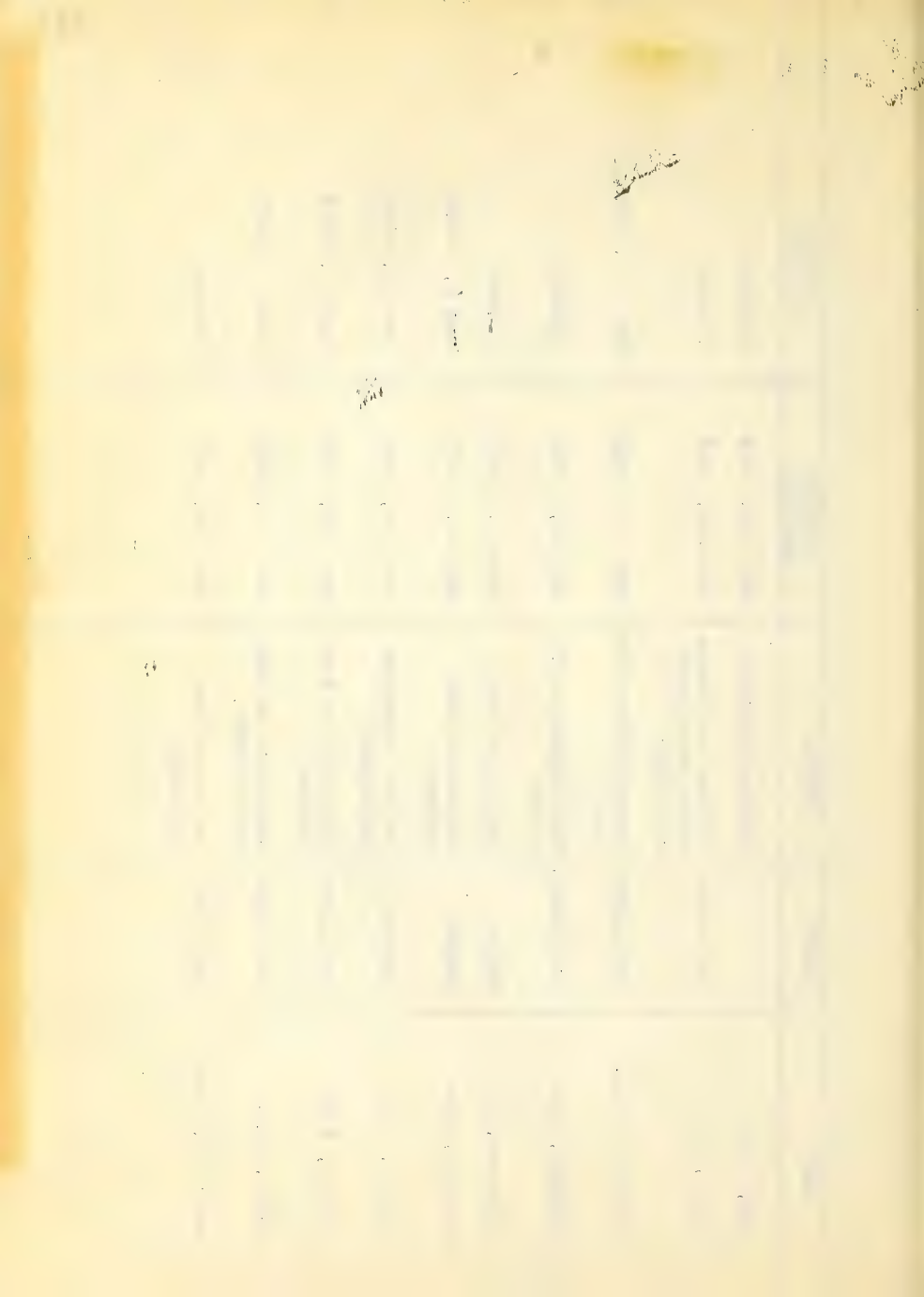
Discussion continued on Page 171.

THE ADMINISTRATIVE STAFF

COMMISSIONED OFFICERS

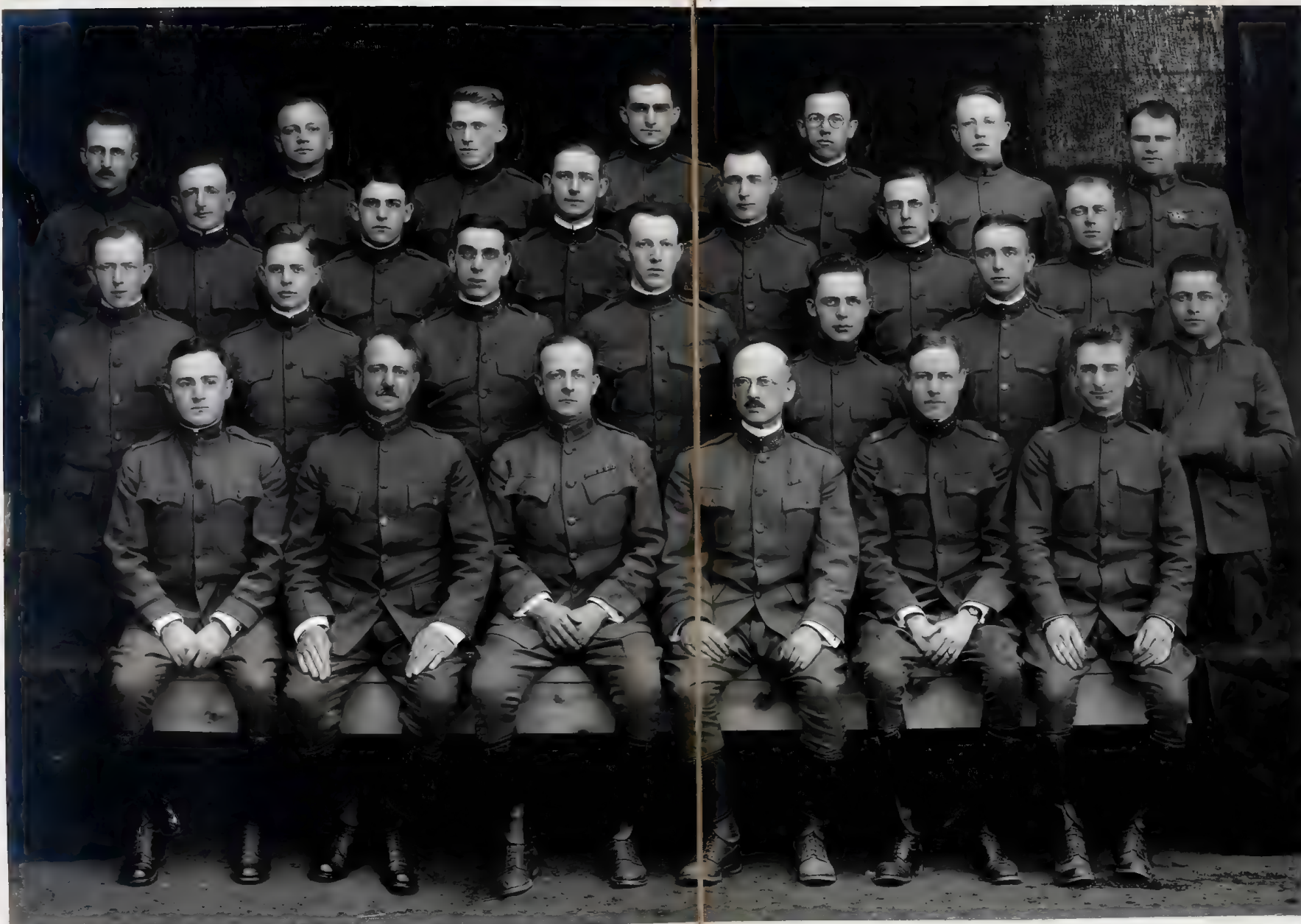
NAME	RANK	DUTIES	DATE OF ARRIVAL	DATE OF LEAVING
Abel, G.R.	1st Lieut.	Personnel Officer Post Insurance Officer	May 19, 1918	Closing
Beardon, M.A.	2nd Lieut.	Assistant to Supply Officer	Sept. 29, 1918	Closing
Cheston, D.M.Jr.	Major	Commandant	Oct. 1, 1917	Aug. 22, 1918
Davidson, H.C.	Major	Commandant	May 28, 1917	Oct. 2, 1917
Eich, C.P.	1st Lieut.	Post Adjutant	Sept. 28, 1918	Closing
Field, W.P.	Captain	President, Aviation Examining Bd.	Oct. 20, 1917	May 7, 1918
Gallagher, R.V.	Captain	Assistant Post Surgeon	June 18, 1918	Nov. 26, 1918
Griswold, R.	Captain	Post Adjutant	Sept. 17, 1917	Nov. 7, 1918
Harris, J.R.	Major	Post Surgeon	Dec. 27, 1917	Closing
Harrison, G.R.	Lt. Col.	Commandant	Sept. 1, 1918	Closing
Hendricks, A.	1st Lieut.	Assistant Supply Officer	Oct. 4, 1918	Closing
Hitchcock, F.P.	2nd Lieut.	Assistant Supply Officer	May 29, 1918	Closing
Hogan, J.R.	1st Lieut.	Post Dentist	Jan. 11, 1918	Closing

NAME	RANK	DUTIES	DATE OF ARRIVAL	DATE OF LEAVING
Lee, W.F.		Contract Surgeon	Mar. 16, 1918	Closing
Ligon, R.	2nd Lieut.	Officer in Charge 814th Depot Aero Squadron	Sept. 21, 1918	Closing
McG rath, J.L.	1st Lieut.	Administration Of- fice	Feb. 9, 1918	Mar. 9, 1918
Markley, J.B.	1st Lieut.	Post Exchange Of- ficer	May 15, 1918	Closing
Mulliken, H.	Major	Supply Officer	Oct. 1, 1917	Closing
Munford, S.A.	Captain	Assistant Post Surgeon	May 25, 1917	June 9, 1918
Porter, J.P.	Captain	Medical Research Laboratory	Oct. 11, 1918	Dec. 5, 1918
Sibley, E.R.	1st Lieut.	Assistant to Post Surgeon	Oct. 15, 1917	Apr. 1, 1918
White, J.B.	1st Lieut.	Assistant to Sup- ply Officer	Nov. 1, 1917	Dec. 5, 1917
Woolford, C.S.	1st Lieut.	Assistant Post Adjutant	Nov. 22, 1917	Closing





COMMISSIONED STAFF
May 9, 1918



COMMISSIONED STAFF
May 9, 1918



THE ADMINISTRATIVE STAFF

Civilian and Enlisted

NAME	RANK	DUTIES	DATE OF ARRIVAL	DATE OF LEAVING
Bangs, LeVida M.		Stenographer	Jan. 31, 1918	Sept. 4, 1918.
Brake, C.H.		Toolroom Keeper	Sept. 10, 1917	Aug. 17, 1918.
Brashear, H.R.	Pvt.	Clerk, Office of Post Surgeon	Mar. 13, 1918	Closing
Brogden, C.	Corp.	Bugler	Nov. 3, 1918	Closing
Buckingham, W.W.		Office Boy	Sept. 5, 1918	Closing
Bush, H.S.		Mechanician	Oct. 29, 1917	Closing
Chandler, G.F.	Pvt.	Clerk	Sept. 24, 1918	Closing
Chapman, Frances H.		Stenographer	Aug. 1, 1917	Closing
Chandler, W.B.	Pvt.	Chauffeur and Clerk	May 27, 1918	Nov. 21, 1918
Cody, H.H.	Pvt.	Clerk, Office of Post Surgeon	May 6, 1918	Closing
Cooper, C.H.		Stenographer and Clerk	Mar. 1, 1918	May 25, 1918
Dean, Gertrude M.		Stenographer to Registrar	Apr. 24, 1918	Sept. 1, 1918
Denman, R.H.		Registrar	Aug. 9, 1917	Closing
Eggleston, C.H.	Pvt.	Clerk, Office of Post Surgeon	Nov. 24, 1917	June 17, 1918

NAME	RANK	DUTIES	DATE OF ARRIVAL	DATE OF LEAVING
Eldrett, W.C.		Clerk	Dec. 16, 1917	Oct. 9, 1918
Evans, L.J.	Pvt.	Office of Post Surgeon	May 31, 1918	Closing
Ferrell, W.C.		Stenographer	May 27, 1918	Dec. 1, 1918
Freedman, M.	Sgt.	Stenographer	Sept. 29, 1918	Closing
Garrett, J.W.	Pvt.	Clerk	Mar. 13, 1918	Closing
Geldreich, Louise		Stenographer	Jan. 24, 1918	Sept. 1, 1918
Goodenow, E.P.	Pvt.	Office of Post Surgeon	May 5, 1918	Sept. 13, 1918
Green, C.W.	Sgt. 1/cl	Clerk, Q.M.	Oct. 21, 1918	Closing
Hand, L.T. *	Pvt.	Draftsman, Office of President of Academic Board	Feb. 26, 1918	Oct. 25, 1918
Hart, J.J.	Chauffeur	Chauffeur	May 7, 1918	Closing
Hauber, Minnie L.		Assistant to Mr. Long	Feb. 25, 1918	Aug. 15, 1918
Henry, F.	Corp.	Clerk, Q.M.	Oct. 1, 1918	Dec. 7, 1918
Hoeflin, J.M.		Pay Clerk	Sept. 24, 1918	Closing
			Aug. 30, 1917	Dec. 15, 1918

NAME	RANK	DUTIES	DATE OF ARRIVAL	DATE OF LEAVING
Hogue, O.W.	Pvt.	Chauffeur	Oct. 26, 1918	Closing
Horn, J.A.	M.S.E.	Supply Sergt.	June 12, 1917	Closing
Howland, R.		Messenger and Clerk	Oct. 1, 1917 Oct. 28, 1918	Sept. 1, 1918 Dec. 11, 1918
Hunn, C.T.		Assistant Regis- trar	December 1917	Closing
Hutchinson, E.J.	Pvt.	Clerk, Office of Post Surgeon	Mar. 16, 1918	Closing
Johnson, Pauline O.		Stenographer to Adjutant	Sept. 24, 1917	Closing
Johnson, Rachel H.		Assistant in Records	Sept. 1, 1917	Closing
Kane, Elizabeth M.		Stenographer	Sept. 25, 1918	Closing
Kellogg, C.A.		Mechanician	Dec. 26, 1917	Closing
Landback, J.		Postal Clerk	Dec. 12, 1917	Closing
Landon, Marjorie E.		Typist	Oct. 7, 1918	Closing
Latimore, C.B.		Military Store- keeper	Dec. 8, 1917	Closing
Leib, Mary C.	Pvt.	Stenographer	Dec. 6, 1917	Closing

NAME	RANK	DUTIES	DATE OF ARRIVAL	DATE OF LEAVING
Leva, J.	Corp.	Chauffeur	Sept. 29, 1918	Closing
Lewis, L.V.		Bookkeeper, Q.M.	Oct. 30, 1917	Closing
Long, T.S. *	Sergt.	Clerk, Administration Office	June 19, 1917	Closing
Ludden, J.C.		Secretary to Adjutant	Oct. 17, 1918	Closing
McBride, L.	Pvt.	Clerk, Administration Office	June 17, 1918	Nov. 11, 1918
McDonald, J.C.	Sergt.	Bugler	Aug. 27, 1917	Mar. 9, 1918
MacGlashan, R.A.	Sergt.	Clerk, Q.M.	Sept. 29, 1918	Closing
McKay, A.	Pvt.	Chauffeur	Dec. 13, 1917	Closing
Miller, H.D.	Pvt.	Bugler	July 20, 1918	Closing
Neale, R.J.		Electrician	Nov. 22, 1917	May 9, 1918
Nolan, W.M.	Pvt.	Chauffeur	Oct. 26, 1918	Closing
Padgett, A.A.	Corp.	Orderly	May 27, 1918	Closing
Perkins, C.H.	Pvt.	Clerk Q.M. Dept. and Chauffeur	Feb. 4, 1918	Closing

NAME	RANK	DUTIES	DATE OF ARRIVAL	DATE OF LEAVING
Petrillose, J.E.	Pvt.	Office of Post Surgeon	Nov. 24, 1917	Closing
Pickering, L.S.	Pvt.	Office of Post Surgeon	Mar. 8, 1918	July 15, 1918
Price, Sylvia M.		Stenographer	Oct. 29, 1917	Dec. 7, 1918
Reynolds, Ada M.		File Clerk	Feb. 1, 1918	Closing
Robinson, Edith N.		Secretary to President of the Academic Board	July 17, 1917	Closing
Sanford, Gertrude M.		Clerk of Academic Board	July 18, 1917	Sept. 17, 1918
Schaefer, J.J.		Watchman and Re- ceiving Clerk	Nov. 12, 1917	Closing
Schneider, R.	Pvt.	Chauffeur	Mar. 12, 1918	May 4, 1918
Schupert, W.O.	Sergt.	Clerk	Sept. 24, 1918	Nov. 11, 1918
Shaw, F.W.	Pvt.	Clerk	Jan. 22, 1918	Closing
Shrope, A.W.	Pvt.	Bugler	May 13, 1918	July 11, 1918
Spinner, J.R.	Pvt. 1/Cl.	Assistant to Post Dentist	Jan. 16, 1918	Closing

NAME	RANK	DUTIES	DATE OF ARRIVAL	DATE OF LEAVING
Stacey, C.C.	Pvt.	Office of Post Surgeon	Mar. 7, 1918	Closing
Steil, W.P.	Sergt.	Clerk, Q.M.Dept.	Feb. 9, 1918	Closing
S tull, J.M.	Pvt.	Clerk, Q.M.Dept	July 20, 1918	Closing
Swasey, P.P.	Sgt.1/Cl.	Clerk, Q.M.Office	Oct. 9, 1918	Closing
Sylva, J.	Pvt.	Office of Post Surgeon	July 29, 1918	Closing
Taylor, J.L.	Sgt.1/Cl.	Office of Post Surgeon	June 15, 1917	Aug. 10, 1918
Taylor, J.W.	Pvt.1/Cl.	Office of Post Surgeon	Sept.20, 1918	Nov. 26, 1918
Teirlink, L.F.	Pvt.	Office of Post Surgeon	Oct. 15, 1918	Closing
Thompson, B.H.	Sergt.	Office of Post Surgeon	Jan. 16, 1918	Closing
Van Order, J.A.	Pvt.	Office of Post Surgeon	Sept.30, 1918	Closing
Waldrop, Cary	Pvt.	Office of Post Surgeon	Dec. 31, 1917	Nov.26, 1918
Williams, R.D.	Sergt.	Assistant to A.M.	Aug. 1, 1917	Closing
Woods, C.G.	Corp.	Clerk, Q.M. Office	Mar. 31, 1918	Closing

THE CADET CORPS

The general plan followed in the organization of the Cadet Corps was for each class to be a military unit. For instance, an entering squadron would be "Squadron A, Class of Dec. 1" and the following week "Squadron B, Class of Dec. 1." Later the classes were given numbers and would be known as Squadron A-70, S squadron B-70, etc. The first plan was to have the first three classes organized into a battalion called the "Junior Wing" and the last five into another called the "Senior Wing". The Cadet Regiment had a full compliment of cadet officers. An officer took charge of a squadron when it entered and acted as its company commander till it graduated, having charge of all drill, minor disciplinary action, special privileges, etc.

Cadets in the "Junior Wing" did not receive weekend passes and were used for the majority of the guarding, policing, and fatigue work.

Each cadet wore a plate with his name under a celluloid cover over his left upper coat pocket. The "Junior Wing" cadets had their names on white, the "Senior Wing" on yellow, and Sergeants on pink cards.

When the school went on the twelve week schedule the division into Junior and Senior wings was abolished.

The organization when the school closed had been

begun along different lines. Six permanent companies and a recruit company were being built up. The incoming men were put into the recruit company until they were proficient in Infantry Drill, and then assigned to a company. Under this system the company never graduated as a whole and a permanent organization was maintained.

The cadet regiment had retreat parade under cadet officers three days a week. On Thursday a parade was held under officers from the Academic Department who had not had a great deal of military experience. On Fridays the regiment had review and inspection under its regular officers.

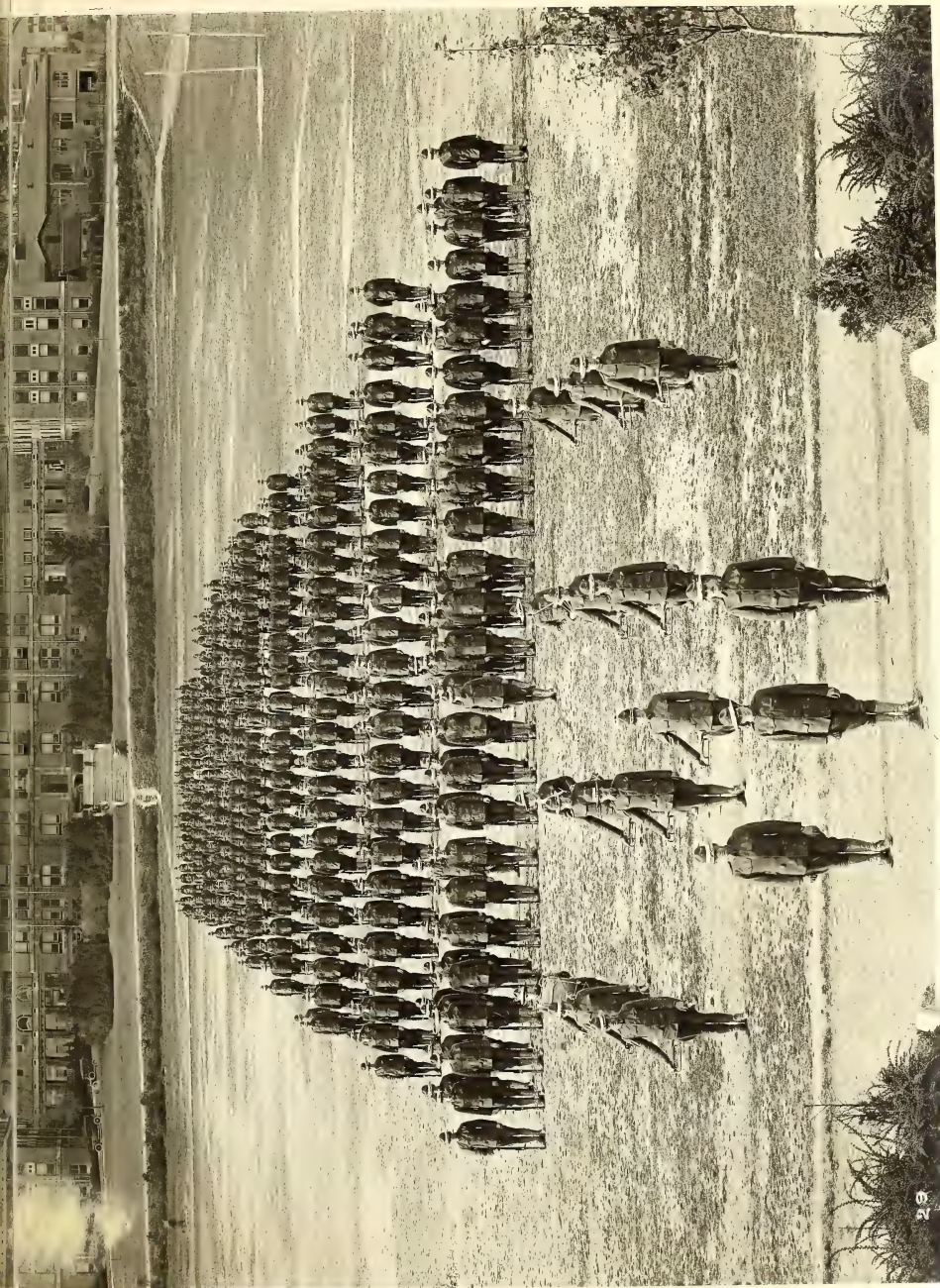
A field music unit was organized under Captain Iglehart and appeared at mess, parades, and reveille.

In the fall of 1918 an excellent football team was developed in the school and won games from Cornell S. A.T.C. and School of Aerial Photography. Inter-squadrons games of baseball, basketball, tennis, and push ball were features of the organized sports work. Several boxing and wrestling contests were arranged by the Y.M.C.A. which maintained an organization for the service schools in Ithaca.

Beginning in September 1918 a number of very successful entertainments were given on Friday nights in the University Auditorium, Bailey Hall. In combination with

the Photography School, musical and comedy sketches were arranged. The Y.M.C.A. furnished moving pictures.

The Cadet Corps maintained an "Honor System" in regard to examinations. Each incoming class subscribed to the system. The Honor System Committee consisted of the first Sergeants of the several classes. They tried a man who was reported for cheating and recommended guilty ones to the Commandant for discharge.



THE CADET CORPS

THE CADET PERSONNEL

NUMBERS OF CADETS.

When Cornell University was first asked to train aviators in ground work it was expected that in all about one hundred men would be sent here, and when the school closed more than three thousand men had been graduated!

After concrete plans had been made for the school it was planned to send twenty-five cadets per week and graduate about twenty-five per week, keeping a total of about two hundred men under training at one time. The number per week was gradually increased and on September 18, 1917, Cornell was asked to take seventy-five per week beginning November 17, 1917. Even this number was finally exceeded, and in January 1918 the total number under instruction was eight hundred twenty-three, counting about fifty Student Officer Engineers. The number fell off for a while and reached a maximum again in July 1918. Shortly after this no new men arrived for squadron A and on August 5, 1918 Cornell University was notified that on account of the training of personnel exceeding the production of equipment, it had been decided to discontinue the School of Military Aeronautics at Ithaca. Shortly after this the following letter was received

by the Acting President of the University:

"1. In discontinuing the School of Military Aeronautics, Cornell University, Ithaca, New York, in compliance with the directions of the General Staff, the Department of Military Aeronautics desires to express its very sincere appreciation of the excellent service rendered by Cornell University in the maintenance of both this school and the Photographic School.

"2. All requests of the Air Service have been most cheerfully complied with at all times by the University and the instruction furnished has always been regarded as of a high quality and thoroughly satisfactory. The services of Professor W. N. Barnard, President of the Academic Board, have been particularly efficient.

"3. The discontinuance of the School of Military Aeronautics at Cornell University was due to no lack of efficient support and co-operation on the part of the University.

By direction of Major General Kenly:

(Signed) Milton F. Davis
Colonel, Signal Corps,
Chief of Training."

On Aug. 22, 1918, the following telegram was received:

"Letter being sent today to General Staff requesting authority to continue your school. Advise holding your corps of instructors.

(Signed) Kenly."

A new Commandant was assigned and on September 13, 1918 official notice of the continuing of the School was received from the Adjutant General of the Army.

CADETS TURNED BACK
AND DISCHARGED.

Under regulations prescribed from time to time cadets were turned back or discharged for failures in studies, discipline, health, and efficiency (qualities which in the opinion of the instructors, showed a man's probable success as an officer in the Army.)

Marks were reported every week in scholarship, efficiency and discipline. At first the Academic Board recommended cadets for discharge and to be turned back, and the Commandant acted as he saw fit. If he decided to discharge a man, record was made of the reasons and the data forwarded to Washington and the man sent home to await official discharge. Later the authority was given the Commandant to discharge cadets directly.

On September 15, 1917, the Commandant was ordered to form an Examining Board to decide on the fitness of the cadets. This board consisted of the Commandant, the President of the Academic Board, and one or more other officers. The procedure followed from that time on was more systematic. The Academic Board went over the records of the cadets when the marks were turned in on Saturday. All men who had low marks in general, failures in final examinations, who had been on the sick report, or who, in the opinion of the Board, should repeat their work, were "turned back" to the week they had just finished instead of being allowed to

continue with their squadrons. They did not necessarily take all of the work of that week. Such remarks appeared on the "Turn Back Sheet" as: "To take all of 'L'", "To take Engines, Observation and drill with H", "To take Airplanes and Signalling", "To take Gunnery and all possible signalling."

When the record of a man was conspicuously low, or he had been turned back before, or was absent from class without leave, etc., a star was placed before his name on the "Turn Back Sheet" which meant that he was to appear before the "Examining Board" on Monday afternoon. Sometimes a man with a poor record in efficiency and discipline would be ordered before the "Examining Board" but not turned back.

The Examining Board interviewed the cadet and decided whether he would be discharged, allowed to go ahead with his squadron, turned back in all subjects, or disciplined. Some cadets were allowed to resign, or be relieved from aviation training for commission, at their "own request."

Men who had entered the school from the Signal Enlisted Reserve Corps, upon discharge were given their option of assignment to an Aero Squadron or being returned to civil life, and their Draft Boards notified. Enlisted men who had come from other branches of the service were given their option of being returned to their former organizations or to an aero squadron.

DISCIPLINE. As a general rule, very little trouble was had with men thru breaches of discipline. Minor offences were punished thru the office of the Senior Military Instructor by confinement to quarters, fatigue work, and "kitchen police." Serious breaches of discipline such as cheating in examinations, stealing, and A.W.O.L. were referred to the Examining Board for action. Men were usually discharged for such offences.

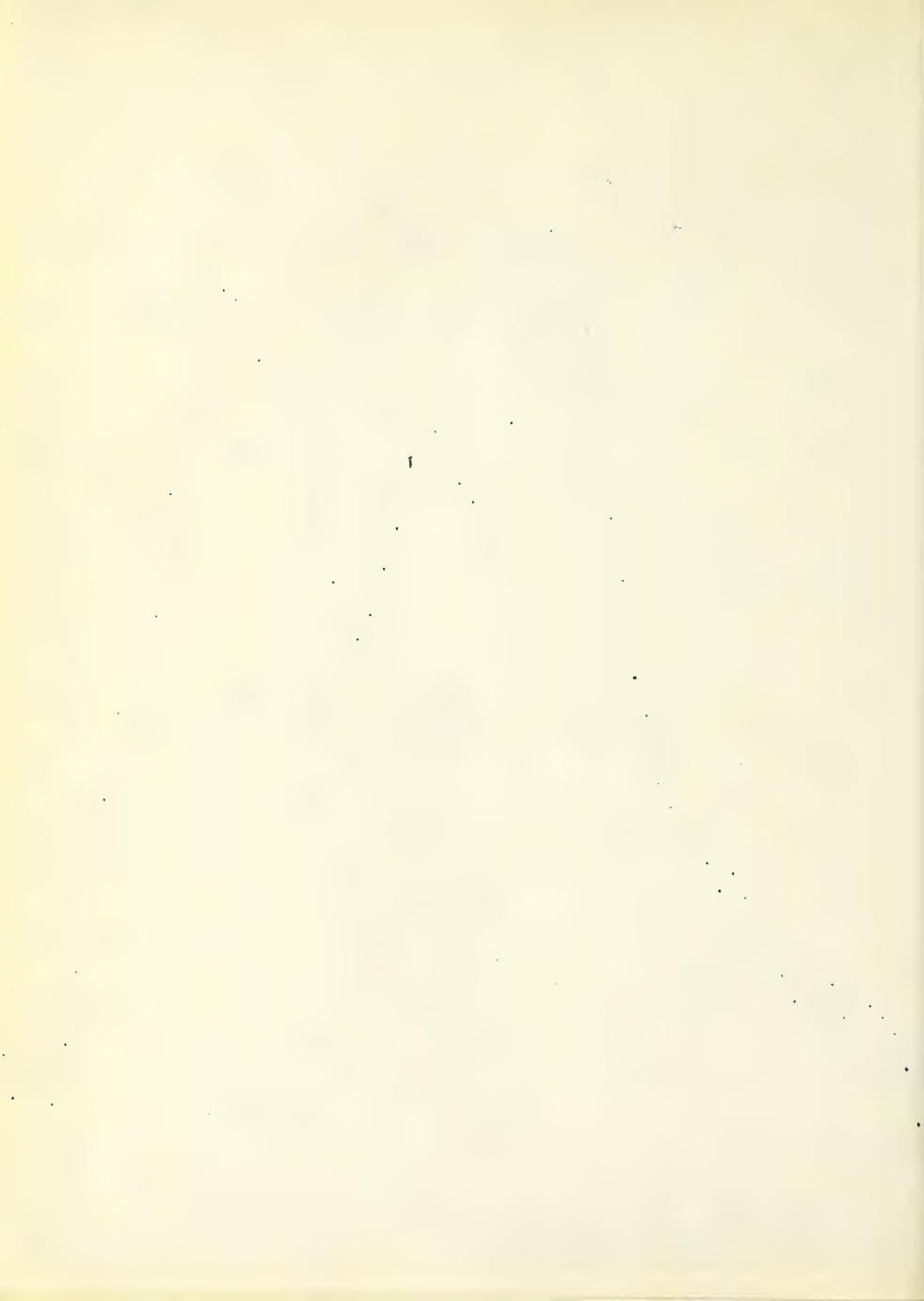
Engineer Officers

Curve Showing
NUMBER of CADETS
at
U. S. A. S. M. A.
Cornell University
Ithaca
N. Y.

1917

1918

JUNE | JULY | AUG | SEPT | OCT | NOV | DEC | JAN | FEB | MARCH | APR | MAY | JUNE | JULY | AUG | SEPT | OCT |



STATISTICS

OF
V.S.A. S.M.A.

CORNELL UNIVERSITY

ITHACA

N.Y.

— N° TURNED BACK

— N° OF DISCHARGED

— N° BROKE BEFORE

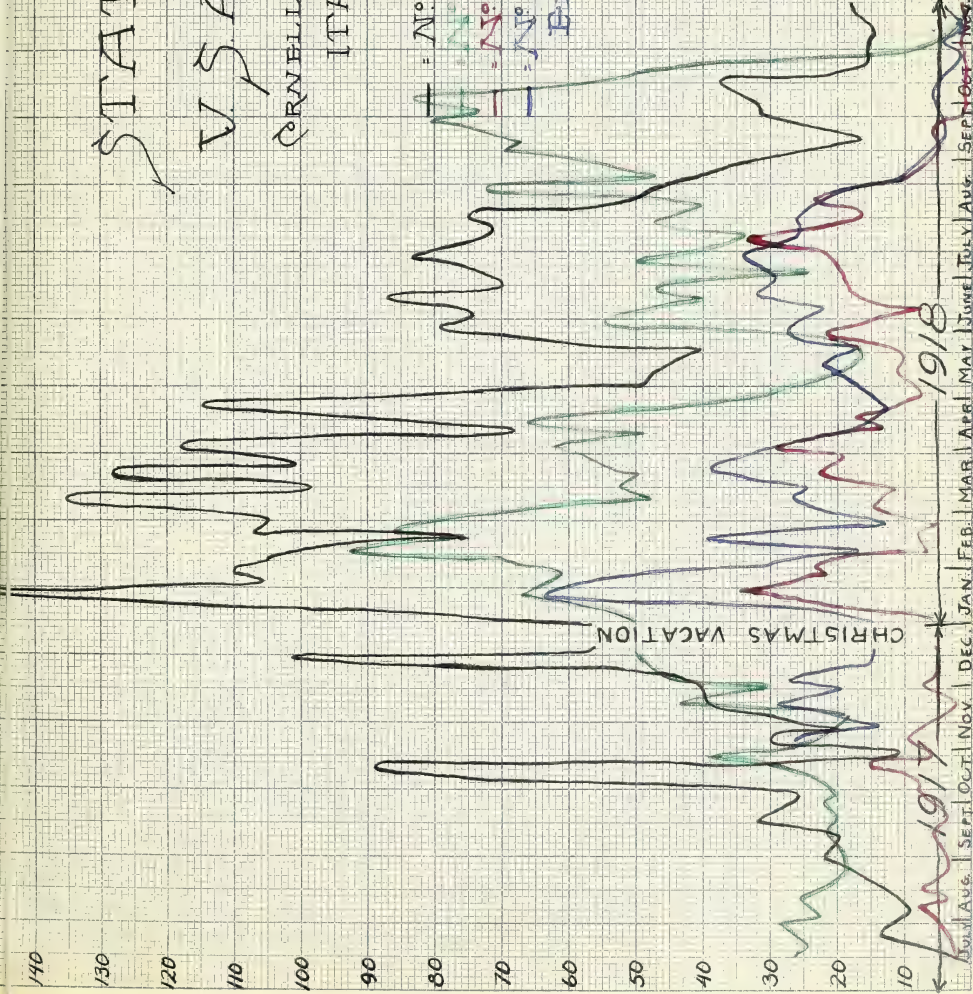
EXAMINING BOARD

CHRISTMAS VACATION

1918

AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV.

140
130
120
110
100
90
80
70
60
50
40
30
20
10



MEMORANDA RELATING TO DISCHARGING AND
TURNING BACK CADETS

MEMORANDUM No. 167.

September 15, 1917.

"2..... A student may be discharged at any time during his course of training by reason of failure to pass tests or examinations, by giving evidence to his Commanding Officer that he is unfitted mentally, morally, or physically for the duties of a flying officer, or for any other reason which shall, in the opinion of the Examining Board, subject to such approval as is necessary, render his services no longer desired.

3. No candidate will be sent to a Flying School who has not passed all final examinations in the Ground School, and candidates who fail but have excellent records for conduct and diligence may, at the option of the Commandant, be permitted to repeat examinations. Those who fail to pass or whose record for conduct and diligence is not creditable will be recommended for discharge.

4. The Board of Examiners when dealing with recommendations for discharge shall consist of the Commandant and at least one other commissioned officer. This board will summon candidates proposed for discharge. The Senior member will explain to the candidate the charges, as for example, failure in studies, unmilitary conduct, indifference, inefficiency, etc. The candidate will have the opportunity to reply. His reply will be noted in the proceedings of the Board and will be forwarded to this office as part of its record."

MEMORANDUM No. 196.

September 26, 1917.

"1.....The Adjutant General has issued orders authorizing Commandants to discharge any student who evidences unfitness for his duties by reason of his habits, lack of character, inefficiency, or who is guilty of misconduct."

MEMORANDUM No. 295.

April 3, 1918.

1. A cadet is liable to demotion under the following conditions: (exception Par. 8)

- (a) Two failures in one week.
- (b) One failure and two low marks (60-65) in one week.
- (c) Failure in any final examination.
- (d) Two consecutive failures in the same subject.

2. Failures and low marks except as mentioned above and in paragraph 4, should not be considered cause for demotion or discharge.

3. A cadet should be demoted the first time he is liable to demotion and should be discharged the second time.

4. Exceptions to paragraphs 2 and 3 above may be made at the discretion of the Examining Board for extraordinary reasons. (Memo. #232, Oct. 30, 1917.) In such cases a special report shall be furnished this office under the heading "Remarks" of the Board Proceedings.

5. A cadet may be discharged at the discretion of the Examining Board as heretofore if he is evidently unfitted to be made an officer. (Memo. #232.)

6. Failure in Efficiency should count as failure in one subject with respect to demotion and discharge.

7. A cadet's mark in Efficiency shall be determined each week by a Board appointed by the Commandant. It shall be based on weekly reports from the cadet's instructors, etc., and shall represent their estimate of the cadet's fitness as an officer as shown by his spirit and military bearing both on and off duty. Account is to be taken of the cadet's alertness, initiative and perseverance. His ability to command a unit in the drill shall be especially noted. In determining the mark in Efficiency, a cadet's record in technical subjects is to be disregarded.

8. Hereafter failure in Signalling prior to the



end of the course shall have no effect on the demotion or discharge of cadets. At the end of the course, a cadet failing in Signalling, but in other respects desirable officer material, shall be retained at the School for one week and given intensive work in Signalling. For this purpose no special classes need be formed but the cadet should be required to attend classes already in operation in order to avoid putting on extra burdens on the instructors in Signalling. If, at the end of this extra week, the cadet's work is still unsatisfactory, he should be discharged. It is assumed that a cadet has been faithful in his practice. If a cadet shirks his work, he should be demoted or discharged as heretofore.

By direction of the Chief Signal Officer:

George A. Washington,
Captain, Signal Corps,
O.I.C., Schools Branch,
Training Section.

MEMORANDUM No. 305.

May 15, 1918.

1. The following is for the information and guidance of all concerned and in particular the Department of Signalling.

2. It is important that both parts of the rule concerning failures in Signalling, Memorandum #295, paragraph 8, should be enforced:

1. "Failure in Signalling prior to the end of the course should have no effect on the demotion or discharge of cadets."

2. "If a cadet shirks his work (in Signalling) he should be demoted or discharged as heretofore."

The first reason for (1.) above, is that progress in Signalling means physiological rather than mental development and it follows that a cadet who is faithful in his

practice should be allowed to attain this development naturally. The purpose for (2.) above, is to insure, as far as possible, as faithful work in the Department of Signalling as in any other department. The judgment of the Department of Signalling will be accepted as to whether or not a cadet has been "faithful" in his practice."

3. The duties of different classes of pilots require different degrees of proficiency in Signalling, some more, some less. For this reason it is desired that every cadet should have the best opportunity of meeting the minimum requirement in Signalling which is made of all cadets. With this in view the Department of Signalling is allowed an advantage which is shared by no other department in that it is possible at the end of the course to retain a cadet at the school and give him intensive work in this department.

4. In connection with the above, the fullest co-operation of the Department is desired.

By direction of the Chief of Air Service:

Geo. A. Washington,
C aptain, Signal Corps.

MEMORANDUM No. 306.

May 15, 1918.

EFFICIENCY

1. The following is for the information and guidance of all concerned:

It is believed that marks in efficiency will fall naturally into three classes:

1. Marks of men who have shown conspicuously that they are the best officer material in the school.
2. Marks of average men with respect to whose desirability as officer material relative

to other men in the school no definite pronouncement is given either pro or con. The data concerning these men will not be sufficiently accurate to allow their marks to be made out with great exactness. Therefore no great effort need be made by the instructors to obtain such exactness.

3. Marks of men who impress their instructors as being undesirable officer material because they do not show "alertness, initiative, and perseverance" and do not give evidence of the proper "spirit and military bearing."

It is believed that the number of cadets in class 1 and class 3 will be small.

2. Any exception made in accordance with paragraph 4, Memorandum #295, will be consistent with the corresponding efficiency reports.

3. The purpose of paragraph 7, Memorandum #295, on efficiency and also paragraph 4 of the same Memorandum, is to allow the school, in choosing officers, a certain reasonable discretion which may be covered by more exact rules issued from this office.

4. In this connection, the fullest cooperation of the schools is desired in the interests of the Air Service.

By direction of the Chief of Air Service:

Geo. A. Washington,
Captain, Signal Corps.

THE CLOSING OF THE SCHOOL

By the end of November 1918 the school had begun on the curriculum which provided for the separate instruction of observers, pilots and bombers after their fourth week.

After the signing of the Armistice the Commandant was notified to return to their draft boards all recruits who reported directly from the draft boards. This reduced the size of the entering classes materially.

On November 20th the following telegram was received from Major General Kenly:

"Orders have been requested transferring all cadets, Lieutenants Lowell Mason, Percy G. McVetty, G.M. Rogers, D.L. Dargue, Harold J. Fisher and Sergeants A.C. Davis, Jr., and Robert I. Blackman to Austin, Texas, to leave Cornell November 23rd, two officers to accompany cadets."

The following telegram was also received:

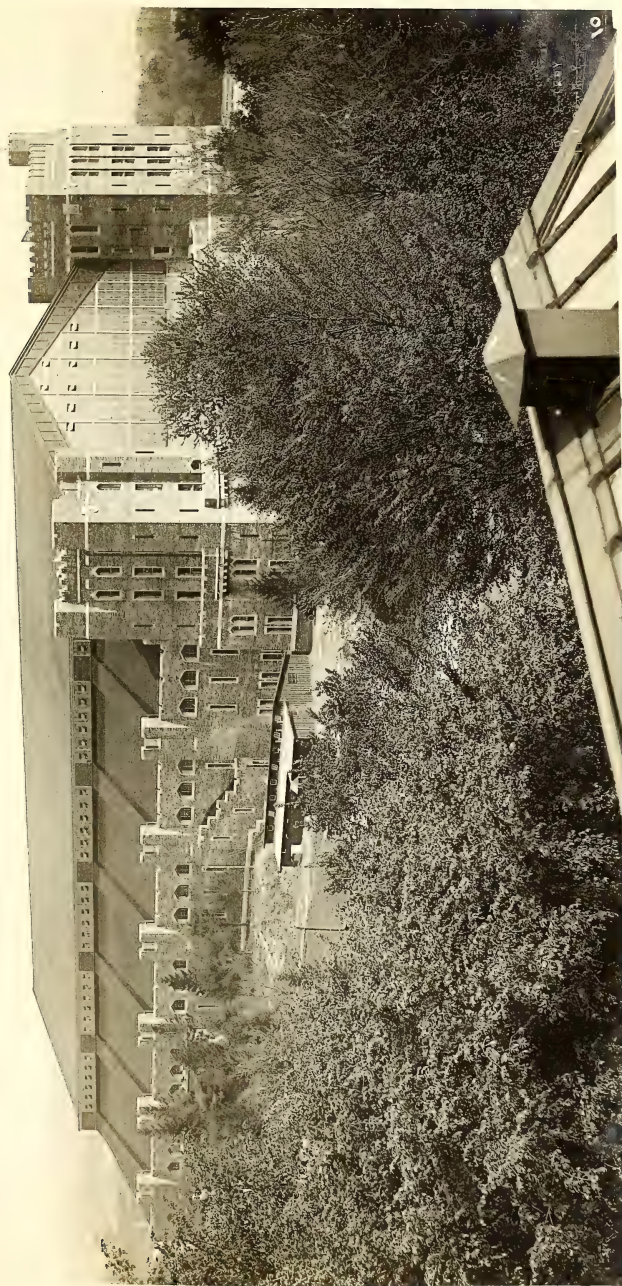
"All cadets now in training at Air Service Flying and Ground Schools will be given option of immediate discharge without commission or of completing their training -----".

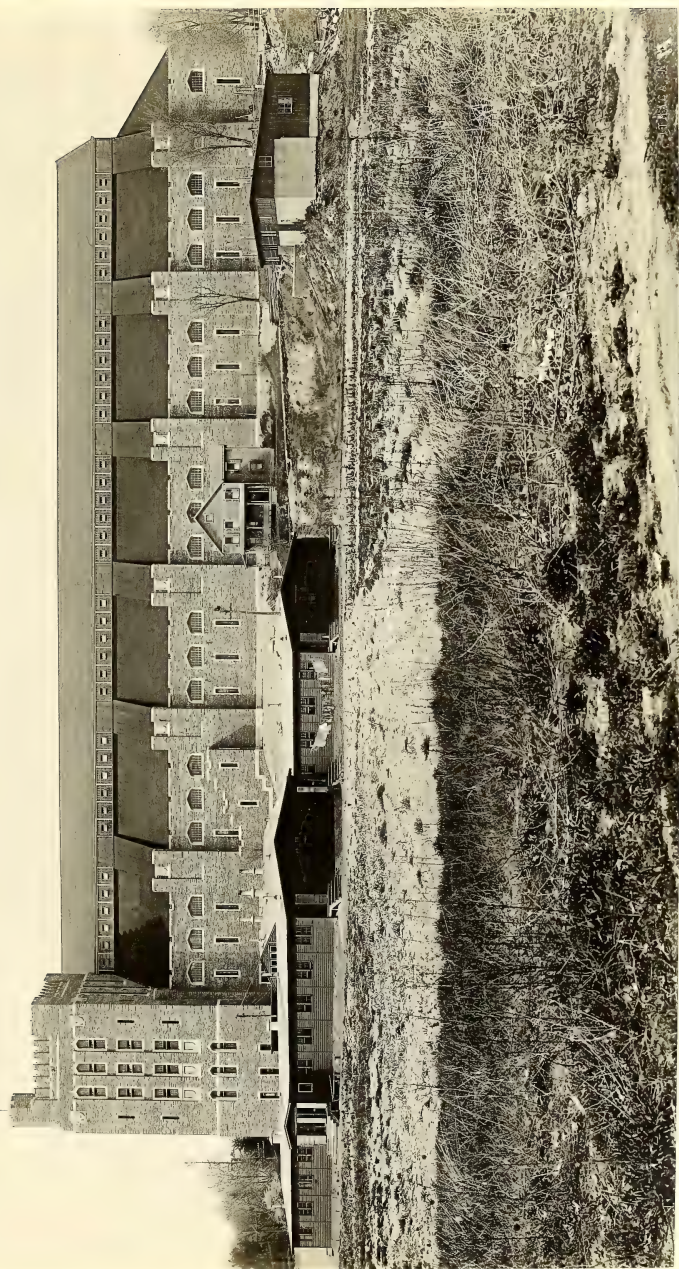
The orders did not arrive in time for the men to leave on November 23rd but fifty-eight of them left on the 26th for the U.S.A.S.M.A., at Austin, Texas. The remaining one hundred seventeen asked for discharge and

were sent home.

The work of dismantling the laboratories and packing the equipment began at once. By December 7th nearly all of the civilian staff had been discontinued and the commissioned and enlisted staff was rapidly finishing up the work of the Administration Department.

NORTHWEST CORNER NEW YORK STATE DRILL HALL





SCUTH SIDE NEW YORK STATE DRILL HALL - MESS HALL IN FOREGROUND



LABORATORIES AND SLEEPING QUARTERS - SOUTH SIDE, LOOKING EAST



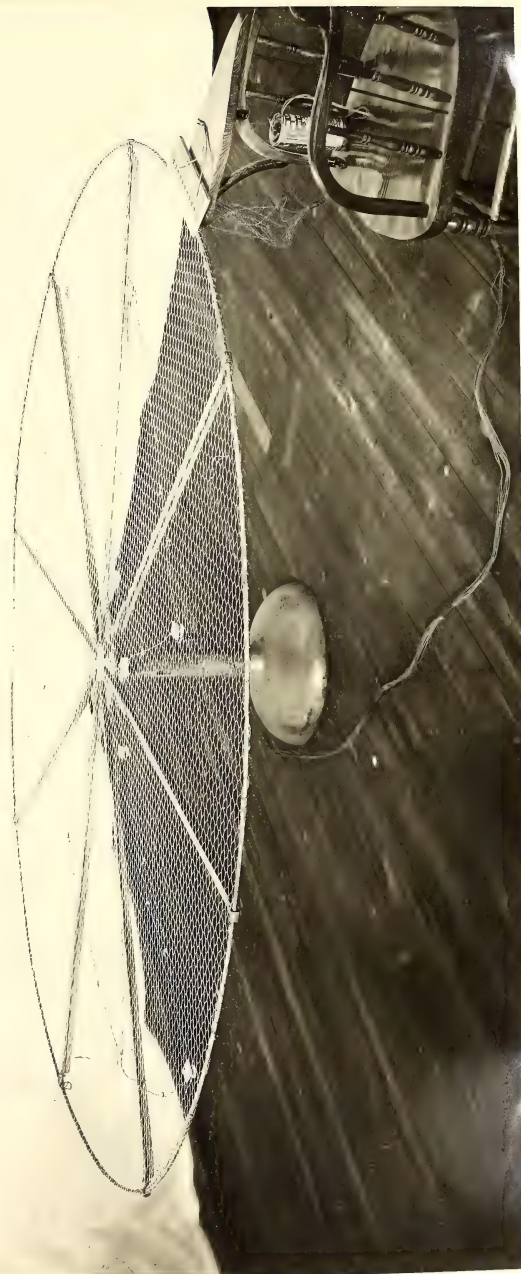
LABORATORIES AND SLEEPING QUARTERS - LOOKING WEST



LABORATORIES AND SLEEPING QUARTERS - NORTH SIDE, LOOKING EAST



THE MINIATURE RANGE



ROTARY MAP FRAME



ROTARY MAP FROM ABOVE



SIGNALING DEPARTMENT - SENDING LABORATORY



SIGNALING DEPARTMENT - RECEIVING LABORATORY

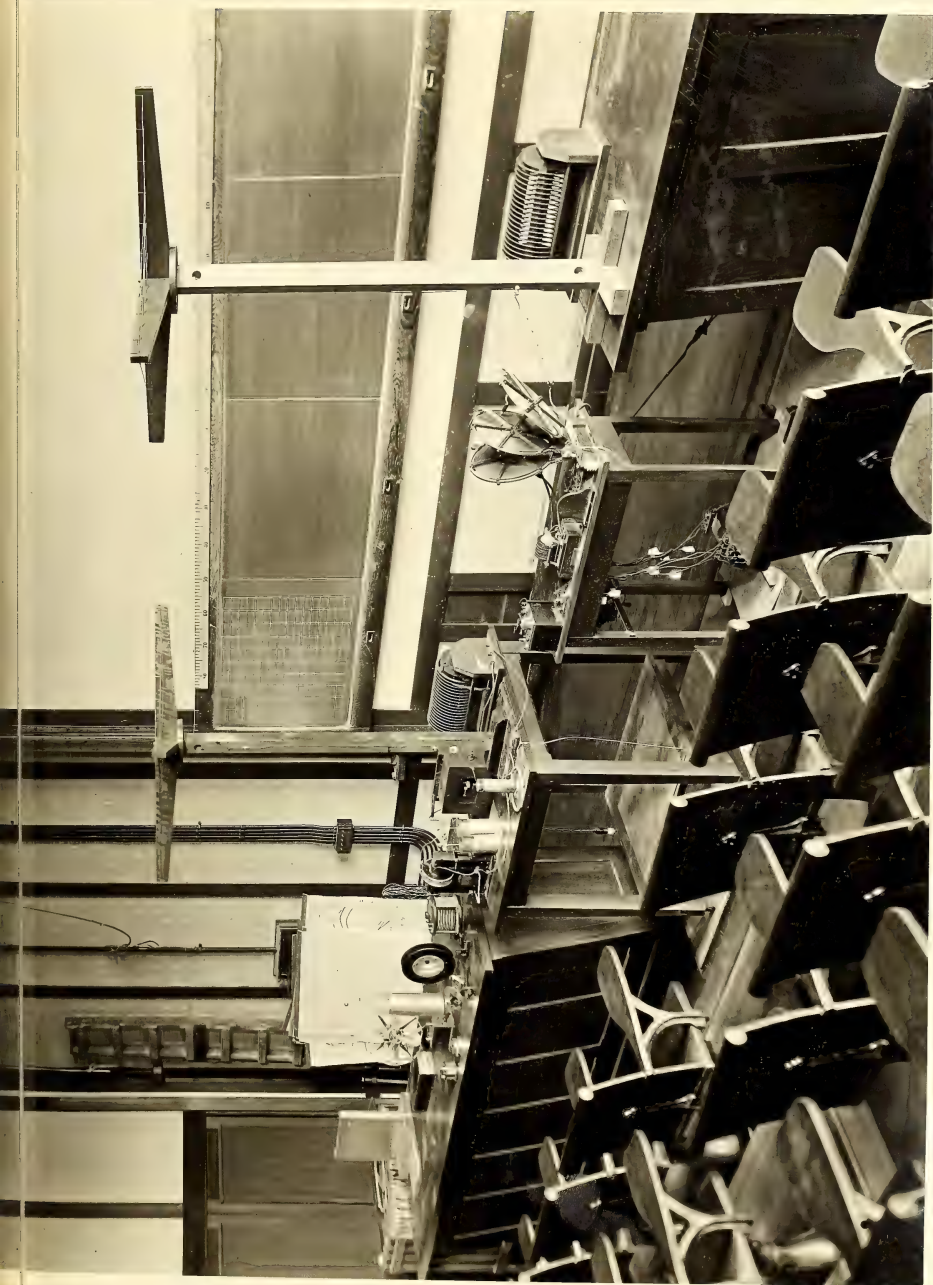


109
SIGNALLING DEPARTMENT - OFFICE AND WIRELESS ROOM



THE A

WASHINGTON, D.C.

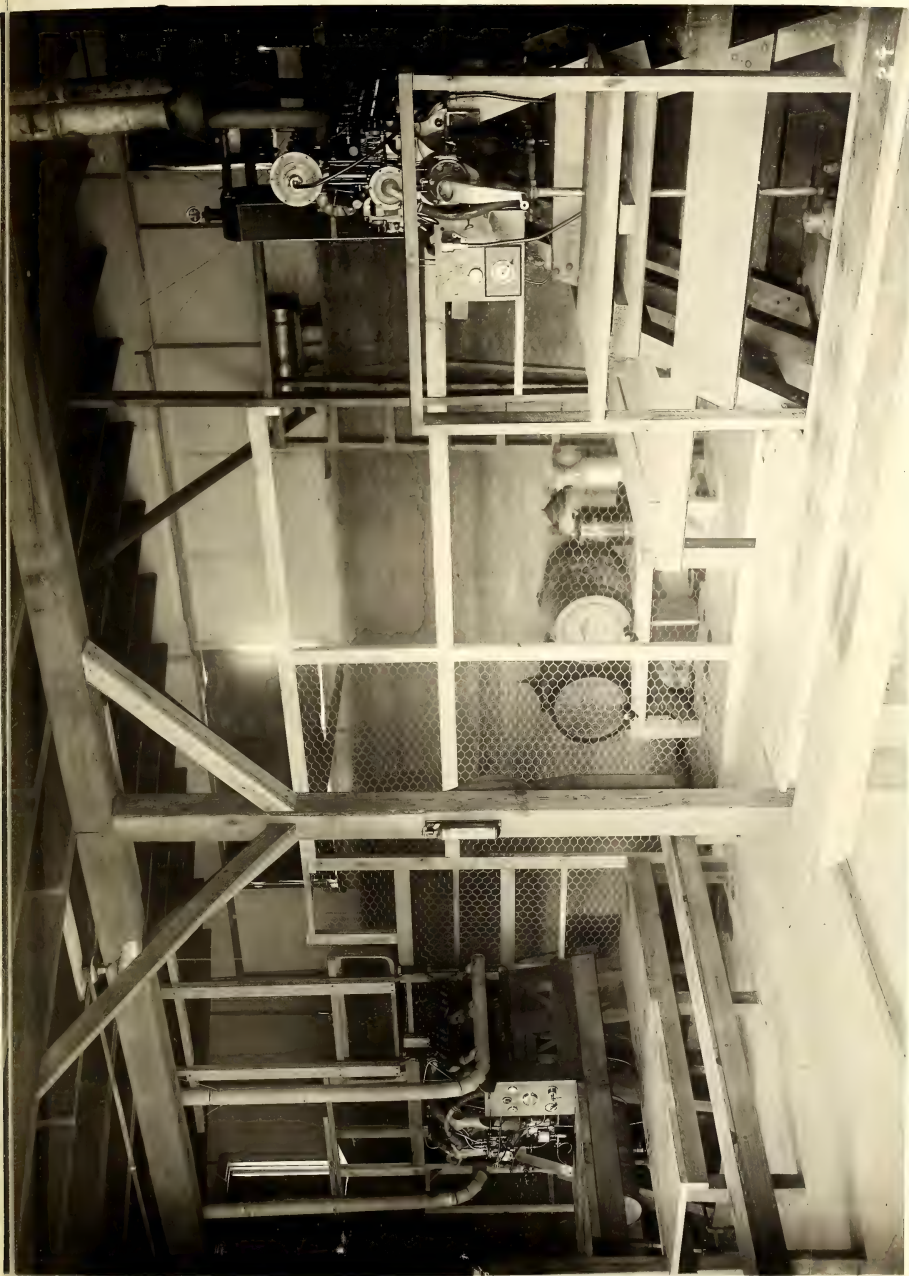


ENGINES LABORATORY





ENGINES LECTURE ROOM, SHOWING WALL CHARTS



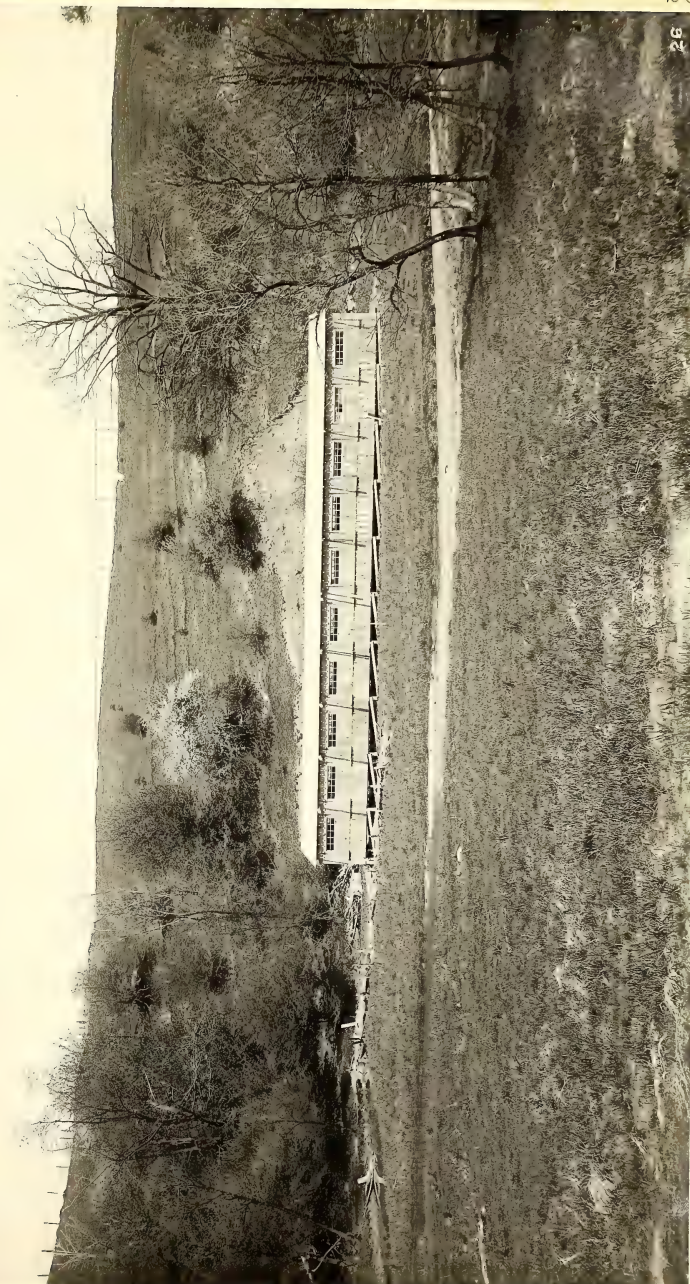


GUNNERY LABORATORY - LEWIS GUNS



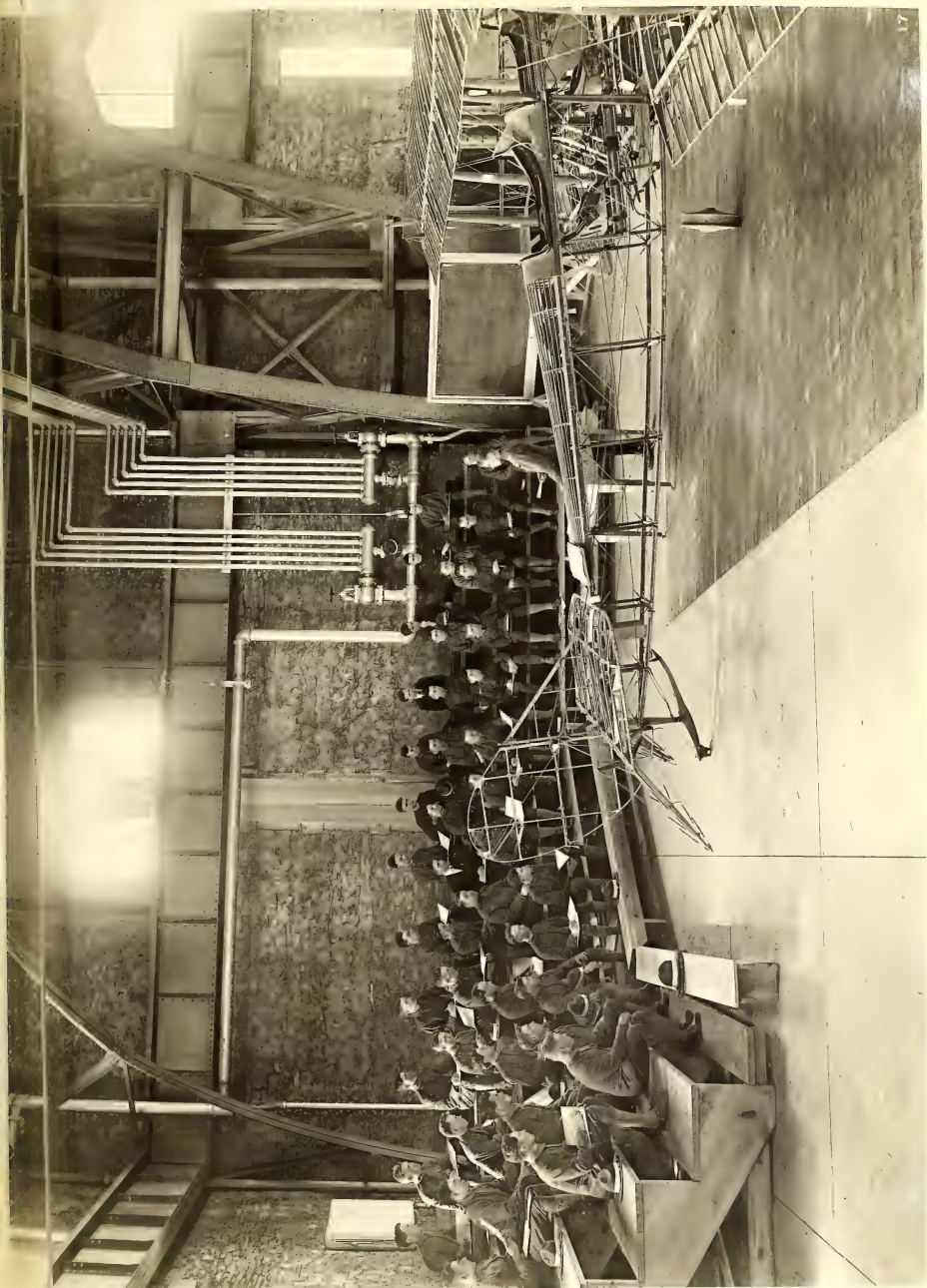


GUNNERY LABORATORY - MARLIN GUNS



FIRING HOUSE - GUNNERY DEPARTMENT





LECTURING IN AIRPLANES LABORATORY





AIRPLANES LABORATORY





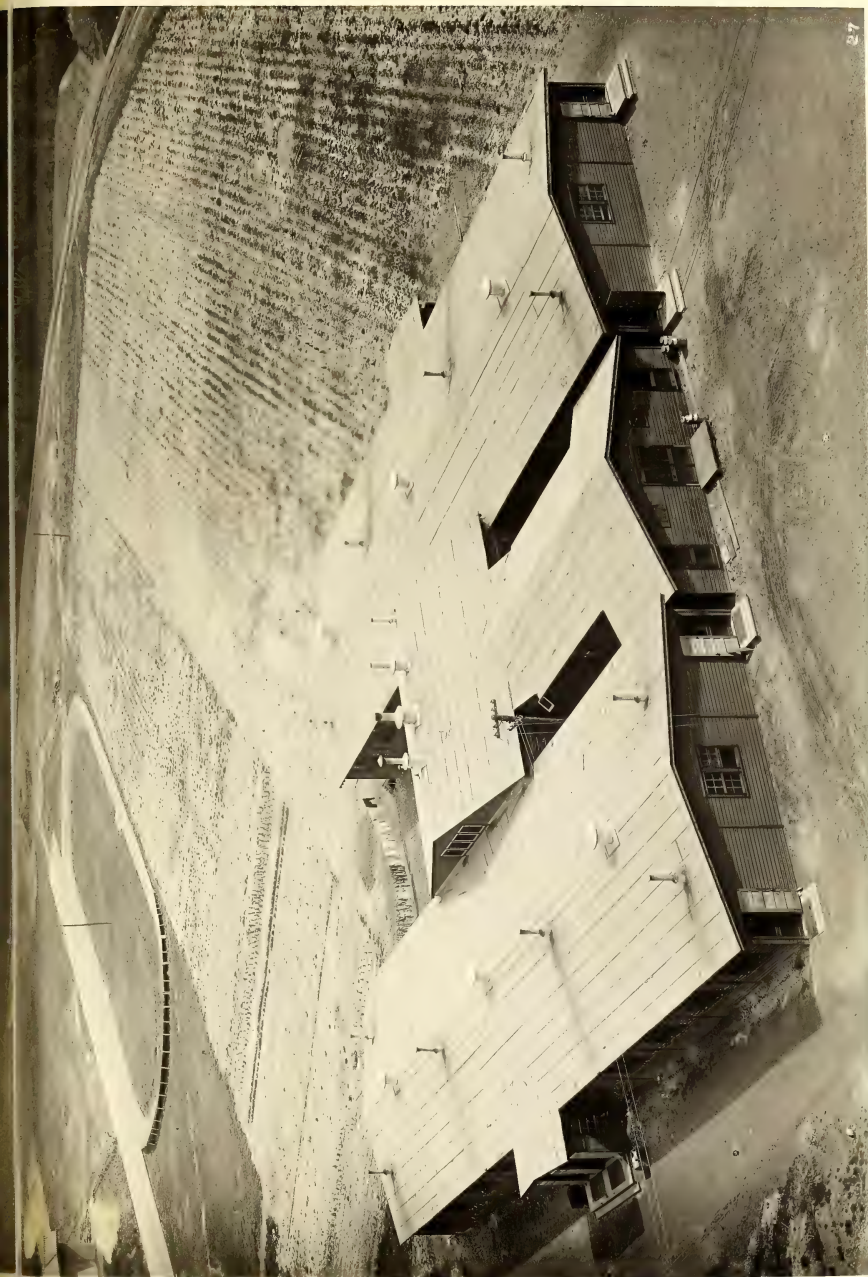
AIRPLANES LABORATORY





SPORTS







MESS HALL





SAMPLES

OF

FORMS

UNITED STATES ARMY SCHOOL

OF MILITARY AERONAUTICS



Name

**INSTRUCTIONS AND MEMORANDA
FOR OFFICERS, INSTRUCTORS
AND OTHER EMPLOYEES**

in the
UNITED STATES
SCHOOL OF MILITARY AERONAUTICS
at
CORNELL UNIVERSITY
ITHACA, N. Y.



Cadet's Name

Class of

REGULATIONS

U. S. Army
School of Military Aeronautics
Cornell University



ITHACA, N. Y.
1918
4

7931

Name _____

**INSTRUCTIONS AND MEMORANDA
FOR OFFICERS, INSTRUCTORS
AND OTHER EMPLOYEES**

in the
**UNITED STATES
SCHOOL OF MILITARY AERONAUTICS
at
CORNELL UNIVERSITY
ITHACA, N. Y.**



Cadet's Name _____

Class of _____

REGULATIONS

**U. S. Army
School of Military Aeronautics
Cornell University**



**ITHACA, N. Y.
1916**

4

**INSTRUCTIONS AND MEMORANDA
FOR OFFICERS, INSTRUCTORS
AND OTHER EMPLOYEES**

**in the
UNITED STATES
SCHOOL OF MILITARY AERONAUTICS
at
CORNELL UNIVERSITY
ITHACA, N. Y.**



Cadet's Name

Class of

REGULATIONS

**U. S. Army
School of Military Aeronautics
Cornell University**



**ITHACA, N. Y.
1918**

4

7931

UNITED STATES ARMY
SCHOOL OF MILITARY AERONAUTICS
AT
CORNELL UNIVERSITY
ITHACA, NEW YORK

MARCH 20, 1918.

Instructions No. 1.

1. These instructions replace those previously issued.
2. They will be followed by all officers, enlisted men and civilian employees connected with the staff of this School, so that there will be uniformity in the matters covered.
3. Instructors will familiarize themselves thoroughly with the Regulations for Cadets, as many of the rules contained therein apply to instructors also and are not repeated here.
4. When the term "instructors" is used herein, it refers to military instructors as well as to those who are civilians.

W. N. BARNARD,
President of Academic Board.

Approved.

D. M. CHESTON, Jr.,
Maj., S. C., Commandant.

x1. **Army School.** It is very important to keep in mind the fact that this is an ARMY school preparing leaders upon whose ability as officers our success in this war may depend. Instructors should impress this upon the flying cadets and have them understand that the standards of this school are much higher than those of the usual college and the purposes different.

x2. **Object of the School.** The chief objects of the School are stated in the Foreword of the Regulations for Cadets.

x3. With these objects in view, it is important to lay great stress on military discipline, accuracy in statement and of observation, reliability and punctuality.

x4. **Methods.** The instructors by their conduct, bearing and methods, whether in or out of class, should at all times serve as examples as to what is desired of future officers in the Aviation Corps.

x5. Instructors are expected to devote substantially all of their time to the work of the School. When several instructors are assigned to the same subject, it is, in general, intended that the squadrons be divided into groups so that cadets will have more personal attention and so that instructors may better form opinions of the conduct and efficiency of the cadets as well as of their scholarship.

x6. All work in classrooms and laboratories should be conducted as nearly on a military basis as conditions permit.

x7. All instructors must be careful to permit no laxness in discipline in class rooms and laboratories.

x8. The Instructor is not to enter into discussions with cadets at the end of the period. This delays formation of the squadron and causes lateness at the next class.

x9. Instructors must be careful not to continue classes

Cadet's Name _____

Class of _____

REGULATIONS

U. S. Army
School of Military Aeronautics
Cornell University



ITHACA, N. Y.
1918

beyond the end of the period. Dismiss the squadron promptly in the manner prescribed in the Regulations for Cadets.

x10. Classes will begin 10 minutes past the hour and will continue to the end of the hour, except that examinations scheduled for the first period of the afternoon may start at 2 P.M.

x11. First call (warning) is sounded 5 minutes before time to dismiss classes.

x12. **Examinations and Quizzes.** All examination and quiz questions should be prepared with the greatest care so as to avoid ambiguity or lack of clearness and they should be carefully written so that a student will have no difficulty in reading them. When there are several parts to a question they shall be lettered a, b, c, etc., so that no part will be overlooked.

x13. The same questions must be repeated as seldom as possible. When a question has proved effective, there is, of course, no objection to using it again, only sufficient time must have elapsed so that it is a new question to the squadron which is being examined.

x14. Each department should prepare with the greatest care a collection of standard questions from which to make selection for examinations and quizzes. These questions should be revised whenever the character of the answers shows that they can be improved. The Engine Department has prepared such a collection and has an excellent system for preventing repetition of the same questions with any one class.

x15. Each examination and quiz should have enough questions so that missing a single answer will not result in a failure in the test.

x16. The method of conducting examinations and quizzes and of disposing of the papers afterwards, should receive the greatest care.

x17. The questions as written on the blackboard should correspond exactly with the copy which is used in connection with the marking of the papers.

x18. Instructors should call attention of the class to the requirement that the Honor Statement be signed. This may be done by adding a note at the end of the examination and numbering it as if it were a question, so it will not be overlooked. This item, however, is not to be considered as a question in grading, as the paper is to be marked zero as a whole if the statement is not signed.

x19. Instructors should be present at all times during the examination to interpret and answer questions, and to see that all papers and other material are handed in in accordance with the Regulations for Cadets.

x20. Instructors should avoid any semblance of spying during examinations, otherwise the cadets will feel that the Honor System is discarded. However, Instructors should take cognisance of any case of fraud coming to their attention.

x21. The questions should be erased from the blackboard immediately after the examination has been completed.

x22. In order to insure uniform grading of all examination papers in a set, the same question in all of the papers should be marked by the same instructor.

x23. Each department should establish standard grades and uniform methods of grading, so that there will be no variation in the standards from week to week, even though changes in instructing personnel occur. Where one instructor has charge of the same group of cadets for several weeks, it is especially important that the instructors work in the same standard.

x24. Two copies of each set of final examination ques-

Cadet's Name _____

Class of _____

REGULATIONS

U. S. Army
School of Military Aeronautics
Cornell University



ITHACA, N. Y.
1918

tions shall be sent to the President of the Academic Board each week. The heading for these questions, as specified by the Schools Section, is as follows:

UNITED STATES ARMY
SCHOOL OF MILITARY AERONAUTICS
AT
CORNELL UNIVERSITY
ITHACA, N. Y.

Final Examination _____ Date _____
Subject _____ Squadron _____ Graduation Date _____

x25. Papers for *final* examinations, together with *question* sheets and *analysis* sheets should be turned into the office of the President of the Academic Board before Monday 12 M. for forwarding to Washington on that day.

x26. An Honor System (See Regulations § 12) somewhat similar to the one at West Point, is in force in this School. In this system, the students themselves see to it that there is no cheating. The instructor remains in the room during the examination to answer questions and should, of course, take notice of any cheating which may come to his attention. The presence of the instructor is not to be considered as relieving the men from being on their honor. The instructor should be particularly careful not to give any semblance of spying, otherwise the cadets may assume a wrong attitude toward the System.

x27. Cases of fraud should be referred to the cadet Honor System Committee.

x28. **Marks.** In reporting weekly marks on the standard sheets it is important that the several copies be exact duplicates of the original and that all be legible. It will be necessary to use the proper grade of carbon

paper, to use heavy enough impressions to make the last copy clear, and to see that all sheets register accurately. On the copy which is to be posted on the bulletin board, the remarks and the marks in conduct and efficiency may be omitted, leaving only the report on scholarship.

x29. No marks are to be reported between 55 and 60. The cadet's grade is not to be raised to 60 unless it is very apparent that he deserves the increase.

x30. Under "Remarks" the instructor should call attention to men who are particularly lacking or who show unusual qualifications. He should also explain the reason for the omission of any mark after any of the names. The Military Department should show, under remarks, which are the cadet officers.

x31. When a mark much below passing is given, especially in conduct and efficiency, some very brief explanation is desired under "Remarks" in the report.

x32. Instructors are not to inform the cadets as to the marks made nor as to whether or not the subjects have been passed. The reports will be posted on the bulletin board.

x33. A mark of 80 in Efficiency or Conduct will be interpreted as meaning that nothing has come to the attention of the instructor to show that the cadet is either above or below normal. Any mark except 80, will mean that the instructor has especially observed the cadet.

x34. **Efficiency.** (See Foreword in the Regulations for Cadets.) In general, marks in efficiency should range from 70 to 90 for a squadron, it being recognized, of course, that exceptional instances may arise where all cadets in a squadron are nearly on a par or where the squadron as a whole ranks higher or lower than the average, or where individual cases fall outside of these limits. Men who should not be graduated because of low efficiency, including lack of general education, should receive marks in efficiency below 60.

Cadet's Name _____

Class of _____

REGULATIONS

U. S. Army
School of Military Aeronautics
Cornell University



ITHACA, N. Y.

1918

4

¶35. The grading in efficiency from week to week should be on the same standard even though the personnel of the instructing staff changes. Each Department should watch its standards.

¶36. In deciding on efficiency, keep in mind that the school is not training mechanics and that although a cadet may be an expert mechanic he may not be a good officer-material; also, he may be an excellent man in the ranks but not suitable for higher position.

¶37. As an aid in grading men in efficiency, decide which man in the squadron you would prefer to select as officer in command of an important mission against the enemy, which would be your second choice and so on and grade the men accordingly.

¶38. **Conduct.** Unmilitary conduct, breaches of discipline, and misdemeanors, including such matters as gum chewing, smoking when and where not permitted, having blouses unbuttoned, etc., must be reported by the Heads of Departments to the *Regimental* Adjutant, who will refer the cases to the Military Instructors in charge of the respective squadrons for action. In making these reports use the special cards which may be obtained from the Regimental Adjutant.

¶39. Hereafter, the Military instructors in charge of squadrons will be the only ones to make reports on conduct (see instructions under Marks).

¶40. **Time Missed.** Heads of Departments will make written reports each Monday to the President of the Academic Board regarding time missed in the preceding week by instructors, clerks, and other employees, in their departments. A standard form will be used for this purpose.

¶41. If it is necessary for an instructor, clerk, or other employee to be off duty he will make arrangements in

advance with the head of his department regarding the matter. If the duration of the absence is more than a day, commissioned officers on active duty, will also obtain the approval of the Commandant, others must have the permission from the President of the Academic Board.

¶42. Before going off duty for more than one day instructors and other employees will sign the Register in the Adjutant's Office.

¶43. **Giving Out Information.** All connected with the School are to be particularly careful not to give out information of any kind regarding this School. No photos are to be taken except on special orders from Washington.

¶44. **Visitors.** Instructors are not to bring alumni, faculty members, relatives or others into the School as sight seers. Passes will be issued only under very exceptional circumstances. Such passes are issued by the Adjutant only.

¶45. **Speaking at Public Gatherings.** No one connected with the school is to give public addresses that will interfere with their duties at the school, or that will divulge information about the school, unless they have the approval of the Commandant, or of the President of the Academic Board.

¶46. **Official Time.** The clock on the front of the Balcony in the Drill Hall is the official time piece. No one is to wind or regulate it unless especially delegated to do so by the President of the Academic Board.

¶47. **Bills.** The University Treasurer will refuse to pay any bill contracted by any member of the instructing staff of this School if it has not been covered by a University order made out before the purchase is made. In consequence it will be necessary in every case to secure

Cadet's Name

Class of

REGULATIONS

U. S. Army
School of Military Aeronautics
Cornell University



ITHACA, N. Y.

1918

4

a University order from the office of the President of the Academic Board before making any purchases.

x48. **Supplies.** All requests for the purchase of special supplies for departments shall be made through or by the Heads of the Departments concerned.

x49. Examination and Quiz Blanks, tools and supplies used regularly will be kept in the Tool Room, if supplied by the University, or in the Room of the Military Store Keeper, if issued by the Signal Corps. Receipts are required for all material issued.

x50. Do not throw away damaged or worn out equipment, but return same for official survey.

x51. Office supplies may be obtained from the office of the President of the Academic Board. No one is to help himself to supplies without permission, as a record is kept of all supplies issued.

x52. Rolls of drawing paper, lettering pens, magazines, etc., borrowed from the Office of President of the Academic Board shall be recorded in the Book of Loans, and are to be returned promptly.

x53. University and Government supplies are not to be employed for personal use. Letter heads are not to be used for scratch paper. Effect such economies as are possible.

x54. The Head of each Department will requisition the supplies needed for his Department during the week, and will keep such supplies in a definite place in his desk or locker. (Do not leave supplies lying around loose.)

x55. No one is to be admitted to the Tool Room except the following: Clerks on duty in the Tool Room, Commandant, Quartermaster, Heads of Departments, and such others as are authorized by the President of the Academic Board.

x56. **Machine Shop.** All except the mechanics of

10

this School and those supervising their work, will be excluded from the Machine Shop, unless authorized by the President of the Academic Board.

x57. **Work for others.** No work of a personal character will be done by employees for themselves or others while on duty.

x58. **Sale of Material.** The rule (see ¶ 18) preventing instructors from engaging in sale of materials to cadets also applies to all employees of this school. No exception to this rule will be made without official approval of the Commandant and President of the Academic Board.

x59. **Watchman.** The watchman is responsible for the condition of the front part of the basement of the Drill Hall.

(a) He will not permit anyone to leave trash, packages, etc., in this part of the building without special approval, and his orders for the removal of such material will be complied with, without delay.

(b) He will not permit parking of automobiles and other vehicles, except those belonging to the Signal Corps, inside of the building nor in front of it.

(c) In general he will not permit vehicles, except those belonging to the School, to enter the driveway in the building.

x60. No vehicles are to enter the east door of the building.

x61. **Library Privileges.** The privileges of the University Library are extended to the members of the Staff of the U. S. Army School of Military Aeronautics at Cornell University the same to be certified to the Librarian by the President of the Academic Board.

x62. **Smoking.** Instructors are not to smoke in places where cadets are prohibited from smoking. They should confine their smoking to their offices when in the building.

11

Cadet's Name _____

Class of _____

REGULATIONS

U. S. Army
School of Military Aeronautics
Cornell University



ITHACA, N. Y.
1916

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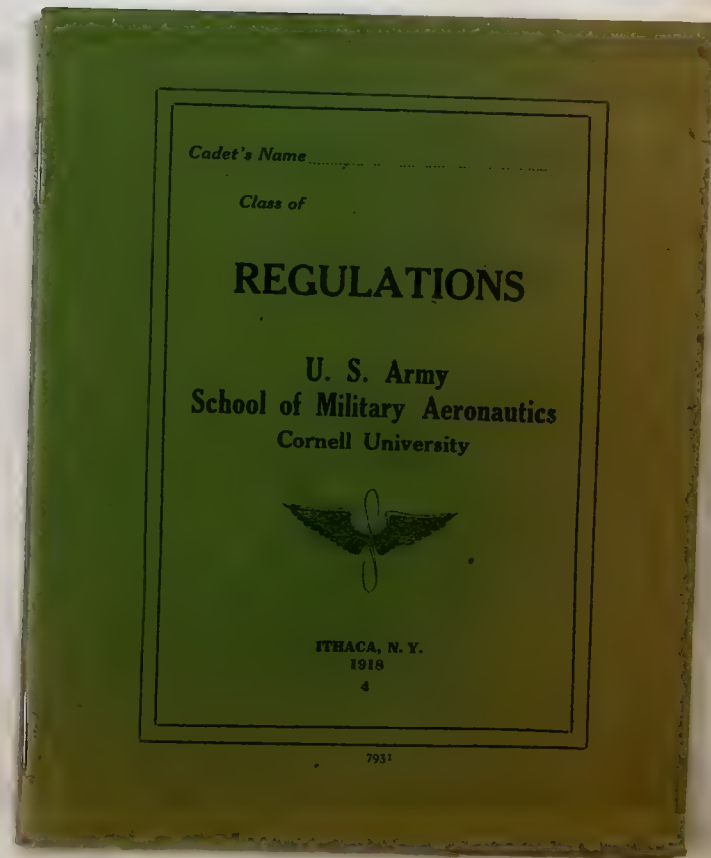
x63. **Uniforms.** Instructors, clerks or other employes who are civilians or who are enlisted men not on active duty, are not to wear uniforms unless they receive the special approval of the Commandant to do so. Requests for permission to wear uniform, officers' hat cord, or leather leggins, are to be made through the Department Head and the President of the Academic Board. Those already equipped with military wearing apparel may continue to use same until further notice, but are not to buy new equipment unless they receive similar approval.

Enlisted men on active duty are not to wear any except the regulation uniform for enlisted men, that is, they are not to wear officers' hat cords or leather leggins or other apparel or insignia of officers.

Each man wearing a uniform must see that it conforms strictly to regulations.

x64. **Turn Backs.** Instructors are not to advise cadets regarding the work to be taken by men turned back. This should be noted especially by members of the Military Department who are the ones most frequently, but erroneously, consulted about such matters. If the information on the Turn Back List is erroneous or not clear, refer all such cases to the Office of the President of the Academic Board and instruct the cadet to submit a military letter regarding the matter.

x65. **Fire.** In case of fire, or other emergency, classes will be dismissed promptly and the Squadron Commanders will conduct the squadrons to their quarters.



Cadet's Name

Class of

REGULATIONS

U. S. Army
School of Military Aeronautics
Cornell University



ITHACA, N. Y.

1918

4

7931

Cadet's Name

Class of

REGULATIONS

U. S. Army
School of Military Aeronautics
Cornell University



ITHACA, N. Y.

1918

4

7931

Name

**INSTRUCTIONS AND MEMORANDA
FOR OFFICERS, INSTRUCTORS
AND OTHER EMPLOYEES**

in the
**UNITED STATES
SCHOOL OF MILITARY AERONAUTICS**
at
CORNELL UNIVERSITY
ITHACA, N. Y.



Cadet's Name

Class of

REGULATIONS

**U. S. Army
School of Military Aeronautics
Cornell University**



**ITHACA, N. Y.
1918**

4

7931

REGULATIONS

U. S. Army
School of Military Aeronautics
Cornell University



ITHACA, N. Y.

1918

4

U. S. ARMY
SCHOOL OF MILITARY AERONAUTICS
CORNELL UNIVERSITY
ITHACA, N. Y.

GENERAL ORDERS No. 4.

FEBRUARY 6, 1918.

1. The information contained in this book is furnished for the guidance of all concerned.
2. The regulations contained therein will be observed.
3. Any previous orders from this office in conflict are hereby revoked.

By Order of MAJOR CHESTON :

ROBERTSON GRISWOLD
Capt., A.S., Sig.R.C.,
Adjutant.

Revised : (2), 3-18-'18 (3), 5-9-'18 (4) 7-20-18.

DIRECTORY

Commandant,
 Maj. D. M. Cheston, Jr.,—Room 12, North Tower
 Post Adjutant,
 Capt. Robertson Griswold—Room 12, North Tower
 Q.M. and Supply Officer,
 Capt. Harral Mulliken—Room 13, North Tower
 Surgeon,
 Major J. R. Harris—Room 11, North Tower
 Senior Military Instructor,
 Capt. Geo. R. Phipps—Room B, under Balcony
 Mess Officer,
 Lt. W. C. Severinghaus—Room 12, North Tower
 Insurance and Allotment Officer,
 Lt. J. B. Markley—Room 12, North Tower
 Personnel Officer,
 Lt. G. R. Abel—Room 12, North Tower
 Regimental Adjutant,
 Lt. F. W. Cady, jr.,—Room B, under Balcony
 President of Academic Board,
 W. N. Barnard—Room A, under Balcony
 Registrar,
 R. H. Denman—Room 12, North Tower
 Pay Clerk,
 J. M. Hoefflin—Room 13, North Tower
 Clerk of Academic Board,
 Miss Sanford—Room A, under Balcony
 Notary Public,
 Mrs. E. Robinson—Room A, Under Balcony

FOREWORD

There are two facts that men entering this school should get firmly fixed in their minds and keep always before them while here and those facts are that this is a **U. S. Army Post** and that its purpose is to prepare leaders on whose ability as air officers our success in this present war may vitally depend. Also it must be realized at once on reporting for duty here, that the requirements of this school in *standard of marks necessary for graduation are higher than those of a college or academy* and that the purposes of the school are entirely different.

The main objects of this school are (1) to make good soldiers, (2) to eliminate poor officer material as fast as possible, (3) to discover exceptionally good officer material, and (4) to give preliminary training to future air pilots and observers.

Unless a man fully realizes all of the above and enters this school with a fixed determination to "make good" under all conditions, to conform to military discipline absolutely, and to strive always to increase his own efficiency as well as the efficiency of the whole school, he does not possess the qualifications necessary for the making of a good officer and his discharge will be but a question of a short time.

A cadet's conduct here must conform to recognized social and military standards at all times, both on and off duty.

A man, though brilliant as a scholar, may be useless as an officer, and *efficiency* is the term used in this school to indicate a man's probable success as an officer.

The following are some of the characteristics considered here in determining a man's **EFFICIENCY**: (1) **Ability to command and lead others**, (2) **initiative**, (3) **keenness**, (4) **ability to make accurate observations and concise and accurate reports of such observations**, (5) **attentiveness**, (6) **perseverance** and (7) **moral, physical and mental personality**. The relative importance of these characteristics is not necessarily in the order named.

Cadets who are dishonest, tricky, lazy, indifferent, conceited, insubordinate, disobedient, of a general weak character, or lacking in education will be considered as failing in efficiency and unfit to become officers in the Air Service.

In the service of the U. S. Army, orders are orders, finally and absolutely. Ignorance of them is no excuse.

Listen to verbal orders, read posted orders, absorb and obey both.

REGULATIONS

A. ENTERING CADETS

1. Each entering cadet will first report to the Registrar's desk where he will show his authority for reporting here, and will be registered.
2. Each cadet will next report to the office of the Quartermaster, in Room 13, in the north tower, and obtain a memorandum receipt for his cot, bedding, overcoat and slicker.
3. He will take this receipt to the Stock Room, in the south end of the basement, sign it, and receive his cot, bedding, overcoat and slicker. This room is open daily from 9:00 A.M. to 5:00 P.M., except Sunday.
4. Having received these things, each cadet will report to the Sergeant in Charge of Quarters, and be assigned a place for his cot.
5. Finally, each cadet will report to the Officer of the Day, to be assigned to duty.
6. Claims for reimbursement of traveling expenses must be made on the Quartermaster immediately upon arrival at this Post. The claims must be made in duplicate and must be accompanied by cash receipts.
7. The following data must be furnished before a claim can be recognized: (a) Name and rank, (b) Present station, (c) Dates of travel, (d) Authorization for travel, (e) Amount of fare paid, (f) Reason for not using Government transportation, (g) Number of transportation request, or railroad ticket, and name of railroad is-

suings ticket (h) From and to what points traveled and what route.

8. Claims for expenses for meals while enroute are to be made on separate vouchers (in duplicate).

9. Vouchers for transportation expenses or meals are to be signed and sworn to before the Post Adjutant or a Notary Public with seal.

10. Proper vouchers may be obtained from the Pay Clerk.

B. DISCIPLINE

1. This is an officers school and every cadet is a candidate for a commission. Cadets are not expected to be guilty of breaches of discipline, and while sentences are imposed for the offenses that are committed, they are given more as reminders than punishments, and should be considered as such. Efficiency is what counts in the Army, and a man's efficiency is judged, largely, by the degree to which he is amenable to military discipline.

2. Cadet Non-commissioned Officers are vested with the authority usually incident to their respective ranks in the Army and will report any breaches of regulations.

3. Any cadet desiring to speak to an officer or academic official, in any of the offices, will first obtain permission from his squadron commander. On entering the office he will salute and say "Sir, Cadet — has the Squadron Commander's (or some other commissioned officer's) permission to speak to —." Special permission is not required for speaking to an academic instructor at a time which he has designated for consultation.

4. Hats are to be removed on entering any office.

5. No cadet will enter any of the offices, at any time, unless in full uniform.

6. Salutes will be exchanged between officers and cadets except when in military formation, or at drill, mess, work, or games. On stairways cadets will come to attention when an officer passes, but will not salute.

7. Members of this command will not salute with pipes, cigars, or cigarettes in their mouths.

8. **Smoking will not be permitted in the Mess Halls, in the laboratories nor east of the driveway in the basement of the Main Building.** The University may at any time withdraw the smoking privileges in other parts of this building, and this will be done if risks of fire and of damage to property, such as burning edges of tables, are not carefully avoided.

9. **Cadets are not to smoke in other University buildings.**

10. Every smoker will provide himself with an ash tray that is not easily upset, which he will keep by his bunk, and he will see that this is emptied at least once every day.

11. No alcoholic beverages will be brought into this Post. All members of this command are forbidden to drink any alcoholic beverage.

12. No gambling is allowed.

13. Cadets are forbidden to have any firearms, or live ammunition, in their possession, other than those issued to them at this school. Anyone having such articles in his possession will turn the same over to the Regimental Adjutant and can claim them on leaving this school.

14. There may be an inspection of quarters at any time that the Senior Military Instructor sees fit. Every cadet is responsible at all times for the proper policing of the area immediately surrounding his bunk.

15. All lights in quarters will be turned out and all men will be in bed at taps.

16. Squadrons marching to and from classes, mess, and other formations will march at attention.

17. Men turned back will report to the squadron to which they are turned back, and will stand all formations with this squadron.

18. Men awaiting discharge or transfer will stand all formations, except school call, with the organization with which they have been serving. They will be governed by the regulations of this Post as long as they are here.

19. As a precautionary measure, military police are detailed each night to patrol the downtown section of the city. These men are to report any disorders, drinking, etc., and have authority to arrest any enlisted man causing a disturbance.

20. Cadets are not required to salute the instructors or officials in civilian clothes unless they are spoken to by such, or address them, in which case the cadets shall extend the same courtesy as in dealing with officers.

21. No person not connected with the School is allowed inside the building unless he has a pass authorized by the Commandant and issued by the Post Adjutant. Passes will only be issued to persons connected with the Government in some capacity. Cadets finding anyone in the building without a pass will take such person to the Officer of the Day.

22. No soliciting or vending in or about the Drill Hall is permitted except in cases where the Commandant has given a license for such practices.

C. UNIFORM

1. All members of this command will wear the prescribed uniform at all times, whether at the Post or away from it. Every man should realize that it is an honor to wear the U. S. uniform, and should take a proper pride in his appearance, both as to neatness, and as to having on the proper uniform. The wearing of all sorts of clothing that is not regulation not only makes the wearer conspicuous, but it cheapens the uniform.

2. The prescribed uniform must be worn complete, without additions or substitutions.

3. At all drills, and other duties, the complete service uniform as issued will be worn, consisting of: Service hat, with Air Service hat cord and regulation, white piqué hat band; O. D. shirt; O. D. coat and breeches; and canvas leggings. When a man can not obtain canvas leggings from the Quartermaster he will be allowed to wear cloth, spiral puttees.

4. When so directed, by the Commanding Officer, the service coat may be omitted. It may, also, be removed in the class room, at the discretion of the instructor in charge. Any one leaving the immediate vicinity of the Post, of duty, must wear blouse.

5. When the service coat is worn over the O. D. shirt, the collar of the latter should be worn turned down neatly over the coat collar.

6. No ties will be worn.

7. Leather leggings are not regulation for an enlisted man and will not be allowed at any time. Spiral puttees may be worn when off duty only.

8. All articles of uniform are to be worn buttoned up throughout. This applies, particularly, to overcoats and rain coats.

9. If a sweater is worn, it should be of the regulation color and it must be worn underneath the shirt.

10. There is no authority for belts on the issued overcoats, nor for any but regulation insignia.

11. Every cadet will be given two name badges, one for the shirt and one for the blouse. The badges will be worn over the left breast, and one shall be visible at all times when the cadet is on duty. These badges must be turned in before the cadet leaves the Post.

D. QUARTERS

1. *Clothing.* Extra clothing should be kept in foot lockers. If a Cadet has two uniform blouses they can both be put on the same hanger, and should hang from the hook on the edge of the lower shelf. They should be buttoned up throughout. The slicker on a hanger should hang from one of the high hooks on the end of the rack. Service hat should also hang on the end of the rack, and not be left on the bunk, or on the shelves. All clothing must clear the floor by at least two inches. Pajamas should not be rolled up in the bedding roll, but should be put away. Bath robes should hang on the hook along side the slicker.

2. *Shoes.* All shoes in a Cadet's possession should be out at all times. They should be lined up so that the toes are even with the end of the foot locker, and the end of the row of shoes should be touching the foot locker, and not several inches away. While it is not expected that Cadets will keep all shoes polished at all times, it is expected that they will be kept reasonably clean and dusted. Where there is only one bunk to a rack, shoes should be lined up on the side away from the Orderly Room. Shoes in all cases should be lined up pointed *OUT*.

3. *Rifle.* The rifle should be slung from the bunk on the same side on which the shoes are placed. Butt of the

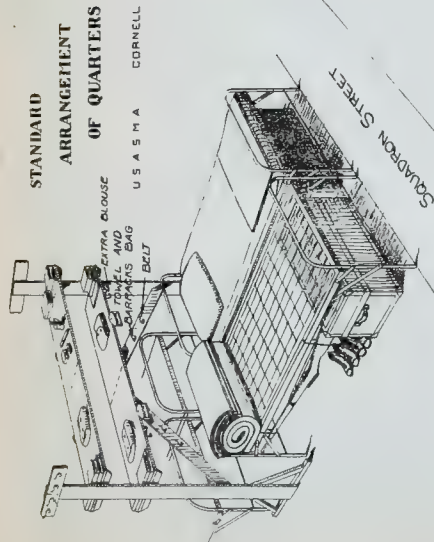
rifle should be toward the foot locker, and about two inches from it. The rifle should not be hung by the sling. The rifles should not be cocked, nor should they have the cut-off up. They should be kept cleaned and dusted at all times.

4. *Shelves.* Shelves should be kept dusted, and should not have any more articles put on them than is necessary. Books should be piled neatly at the end of the shelf, and the necessary toilet articles, if not kept in a case, should be neatly arranged. Bottles of medicine, etc., should be kept out of sight.

5. *Bedding.* Bunks will be made up for morning inspection as follows: The mattress should be rolled from the foot to the head of the bunk, the pillow inside of the roll. Blankets and sheets will be folded in eighths, so as to be of the same size, and placed on top of the roll with a blanket on top, then a sheet, another blanket, second sheet, and the rest of the blankets on the bottom. Folded edges should be toward the front and the outside. Bunks will be left in this manner until noon. Between noon and two o'clock they will be made up for sleeping in. Extra blankets will be folded in eighths, and placed across the foot of the bunk. Pillows will be laid out at the head of the bunk. Pillow cases should be reasonably clean.

6. *Miscellaneous.* No reading matter should be kept on the shelves unless it is something pertaining to the Cadet's work. No food of any kind is to be kept in the barracks. Trunk lockers should be placed at the foot of the bunk with the hinges toward the company street; they should be kept closed and latched. Suit cases and traveling bags should be kept at the head of the bunk, and suit cases should be laid on their side.

7. There are two hooks on each one of the braces that



support the lower shelves of the racks. The barrack bag should be hung from the upper hook, and the belt should be hung on the lower hook. If there is a laundry bag it can be hung from the same hook as the barrack bag, and both of these bags should clear the floor by at least two inches. Towels should be neatly folded and hung on same hook as the barrack bag.

8. Cadets must not be seen outside of the enclosures surrounding their sleeping quarters, unless fully dressed. (No partly dressed men are to be seen under the balcony or in the passage-way between barracks.)

9. Only the side stairways are to be used in going to and from the showers.

E. QUARTERMASTER.

1. The Quartermaster's duties at this Post, in so far as they pertain to the cadets, are to see that the men are clothed, supplied with bedding, paid, and furnished with transportation to their next post. The Quartermaster is responsible, financially, to the Quartermaster General, for all clothing, bedding, etc., issued at this Post. All quartermaster articles are signed for by this Post Quartermaster, on their receipt, and must be accounted for, either by having the articles in stock, or having vouchers to show that these articles were issued to persons legally entitled to receive them. One form of these vouchers is the Bedding and Clothing Slip, signed by a cadet when receiving clothing, etc. As soon as a cadet signs a slip he becomes "responsible" for the articles issued. That is, he assumes the entire responsibility for them and in event of loss or damage, must pay the value of the lost or damaged article and becomes amenable to the 84th Article of War. Such a payment does not, however, release the Quartermaster

from his "Accountability" as he is answerable for so many of each article and not for dollars and cents, and even though a lost article is paid for, his property account is still charged with the lost article. This statement will show how necessary it is for a cadet to safeguard, with great care, all quartermaster property. A claim by a cadet that he did not receive the article for which he originally signed, or that he could not find such articles, will only serve to create an unfavorable impression as to the man's efficiency.

2. Damaged equipment and supplies originally issued by the Quartermaster must not be thrown away under any possible circumstances, but must be turned in to be officially surveyed.

3. Men discharged from this school will turn into the stock room all quartermaster clothing and bedding in their possession.

4. To anticipate discharge, all men will retain in their possession proper civilian clothing in which to leave. In the event of a man being discharged, under no circumstances will he be allowed to wear any quartermaster clothing home.

5. Clothing that has been issued to graduates and non-graduates will, on the transfer of such men to other posts, be transferred to the new Post Quartermaster.

6. Attention is particularly directed to the following portion of the 84th Article of War: "Any soldier who — through neglect — injures or loses any — clothing or property issued for use in the military service shall be punished as a Court Martial may direct."

7. No alteration to any issued clothing is allowed.

8. All men are responsible for the loss and condition of the bedding issued to them by the Quartermaster.

9. Mattresses, mattress covers, pillows, pillow slips, blankets, slickers, barrack bags, and trunk lockers, are issued on Memorandum Receipt, and in every case they shall be turned in to the store room before men leave by reason of graduation or discharge.

10. Trunk lockers are for use in the barracks only, and must, under no circumstances, be removed therefrom.

11. Before leaving men must turn in, with their bedding, one clean pillow slip and one clean sheet. Men will, therefore, make their laundry arrangements accordingly, so that these articles shall not be left in the laundry.

12. When bedding is turned in, the mattress covers, blankets, sheets and pillow slips must be folded in the manner in which they were received from the store room.

13. The shortage of clothing and bedding, due to men going overseas and into the National Army, is a very acute one and men should bear this in mind when making demands on the supply sergeants for clothing.

14. No personal requests to the Quartermaster will be considered. All such matter must be taken up through the Squadron Supply Sergeants.

15. The Squadron Supply Sergeants will make a complete list, including sizes and measurements, of clothing needed by men in their command.

16. Squadron Supply Sergeants will exercise good judgment in requisitioning clothing and not permit a man, who has a good supply of outer uniform clothing, to obtain more.

17. Read paragraph 4 again.

F. SUPPLY OFFICER

1. The Supply Officer is responsible for all Signal Corps property, aeronautical engines, airplanes, machine guns, radio and signalling apparatus, and text books. Each Supply Sergeant will requisition and receipt for text books needed by his squadron and will return all issues to the Military Storekeeper immediately after his squadron has finished using these books. This is important so that the next lower squadron may have its text books furnished promptly by the Military Storekeeper. Any mutilation of books is a serious military offense and cadets so doing are subject to Court-Martial proceedings.

2. Damaged equipment and supplies received from the Supply Officer must not be thrown away, under any possible circumstances, but must be turned in to be officially surveyed.

G. PAY

1. The pay-roll will be signed as near the last day of each month as possible.

2. When ordered to report to receive pay, men will appear on time and will line up according to instructions. If for any good reason a man is absent at pay time, he will report to the Quartermaster as soon as possible thereafter, explaining why he was not present at the regular time.

3. Any unnecessary noise or boisterous behavior, while in line to receive pay, will not be tolerated. Men may be punished, therefore, by being placed at the end of the line or by having their pay withheld for another day.

4. Men shall in every case count their money in the presence of the Quartermaster.

5. By Army Regulations it is not permissible to advance a man any of his pay before the regular pay day.

Cadets will, therefore, not make any requests for advance pay.

6. No checks will be cashed by the Quartermaster.

7. Men wishing to do so, may deposit money with the Quartermaster for safe keeping.

H. ACADEMIC DEPARTMENT

1. The work in class rooms will be conducted as nearly on a military basis as conditions will permit.

2. Upon entering a class room the cadets are to stand at attention, if the instructor is present. The First Sergeant will salute and report. The instructor will return the salute and say "Seats." The First Sergeant will be the last man to enter the room and will close the door if it is so desired. If the instructor is not present when the class arrives the First Sergeant will order the men to be seated. When the instructor enters the room the First Sergeant will give the command "Attention." The cadets will stand at attention until ordered to be seated.

3. Upon entering a laboratory the cadets are to stand at attention until the First Sergeant has made his report to the chief instructor and they receive assignment to work.

4. At the end of the period the instructor will give the command "Attention" and the cadets will rise and stand at attention. The instructor will then give the command: "First Sergeant, take command." The First Sergeant will then assume command.

In laboratories a whistle call may be given as a signal for the squadron to assemble.

5. A cadet desiring to ask a question during a lecture will raise his hand and say: "Question, Sir." If the instructor believes it desirable to permit the interruption at that time he will say "What is it?" Otherwise he will continue with the lecture.

6. No quibbling will be permitted. When a cadet is instructed to do a thing, it is essentially a command and he must do it at once.

7. In all weekly and final examinations, the Cornell custom should be followed, namely, to have the men sit in alternate seats so that the student will not be under a constant effort to keep his eyes from wandering, unconsciously, in the direction of his neighbor's paper. If the seating capacity of the room is not sufficient to permit this arrangement, separate questions (A and B) may be assigned for alternate seats respectively. The student shall state on the cover of his paper which set of questions he has answered, or he may be required to give his seat number.

8. No special examinations or quizzes will be given for making up such tests missed or failed, nor will men have to take such examinations as "make-ups" in the succeeding week, unless so ordered by the President of the Academic Board. If there is an accumulation of deficiencies in weekly grades or absences, the case may be referred to the Examining Board.

9. Standard Examination Books, furnished by the School, will be used in all final examinations. The following directions are printed on the covers of the books:

"1. Sit in alternate seats unless otherwise directed by the officer in charge of the examination.

"2. Use this form of examination book and no other except in case of special permission.

"3. Before beginning the paper, fill out the blanks in the middle of this page.

"4. Use no loose sheets for computations, notes or sketches. Do all of your work on pages of this paper and cross out the parts on which you do not wish to be marked.

"5. The conciseness and completeness of the answers as well as the general appearance of the paper, may have influence in determining the cadet's mark in efficiency.

"6. After completing the examination sign the following:—"STATEMENT:—I have not given nor received unauthorized aid in this examination."

N.B. Papers turned in without signed statements will not be considered.

10. Standard Quiz Sheets, furnished by the School, are to be used in all weekly quizzes. The instructions printed on these sheets are as follows: "1. Do all your work on this sheet,—use no "scratch" paper for computations, sketches, etc. 2. Cross out the work on which you do not wish to be graded. 3. If your work is continued on the back of the sheet add the word 'Over' at the bottom of the page. 4. Sign the following statement after completing the paper: I have neither given nor received unauthorized aid in this quiz. *N.B. Papers turned in without signed statements will not be considered.*"

11. After finishing an examination each cadet is, himself, to hand his paper to the instructor, and at the same time is to hand in mimeographed sheets or other material that has been issued for use during the examination. The cadet will then remain quietly in the room, preferably in the rear, until the instructor dismisses the squadron in the usual manner.

12. The Honor System which is outlined below will be in force. Each squadron shall receive an explanation of the system from the Chairman of the Honor System Committee during its "A" week. After such explanation the squadron will vote on accepting the agreement.

"An Honor System Committee composed of the Cadet Acting First Sergeants, the Cadet Wing Commanders,

and the Regimental Commander, have full authority for the administration of the system provided that the Commandant approve the findings of the said Committee. The Committee shall elect a chairman who should be a man who can present the Honor System properly to Squadron 'A'.

"The professors and instructors will understand that their presence in an examination room is primarily for the purpose of answering questions relative to the examination, but not to spy on the cadets. The presence of the instructor is not to be considered as relieving the cadets of being on their honor.

"Each man shall, at the end of an examination, sign the statement: 'I have neither given nor received unauthorized aid during this examination.' The pledge shall be written or printed on the first page of the book and is to be signed after completing the examination.

"After the questions have been given to the cadets their attention shall be invited to the declaration. *Unsigned papers will be marked zero.*

"Each man is in honor bound to report all violations of the agreement that may come under his notice."

13. The passing mark in all examinations and quizzes is 60%. A general average below 70% is considered unsatisfactory.

14. A mark of zero will be given when a cadet fails to hand in his paper or when he does not take a prescribed examination and has not been excused from it, or when he fails to sign the Honor Statement, or when he has been dishonest in the examination.

15. No marks, or information regarding success in examinations, will be given out by instructors. The reports will be posted on the bulletin board.

16. Notebooks may be inspected in the various courses in order to aid the instructors in determining the effi-

ciency of the cadets, importance being placed upon the following: conciseness, completeness, legibility, and clearness. Voluminous notes are not desired but they should include rather complete outlines of the lectures with such amplifications as seem necessary. The notebooks should be ready for inspection at all times.

17. No instructor is permitted to tutor any cadet in any subject taught in this school. It is not desired to give weak students any advantage over the others.

18. No instructors shall for their own profit or gain, directly or indirectly, engage in the sale of materials to cadets.

19. Men that are turned back for failure in their studies will conform exactly to the instructions on the Turn Back Sheet. N.B. No changes in these instructions will be authorized unless in writing and signed by some member of the Examining Board.

20. Requests for information regarding a cadet's marks, status, etc., shall be made in writing, and shall give the cadet's squadron letter and class, and all information bearing on the case. The request shall be in the form of a military letter, which is to be left at the Office of the President of the Academic Board.

I. EXAMINING BOARD

1. The Examining Board meets every Monday to act on the discharge of cadets and to consider appeals from actions given on the Turn Back Lists.

2. Cadets making appeals must report to the Board in person, and must have handed in to the Clerk of Records in the office of the President of the Academic Board a written statement of their case before 12 o'clock on Monday, so that complete copies of their records may be prepared in time for the Board meeting. These state-

ments must give the cadet's squadron letter and class and must contain complete information about the case.

3. Cadets are cautioned against appealing their cases unless it can be shown clearly that injustice has been done—mere requests for leniency will not be tolerated. Sickness is not recognized as an excuse unless the cadet's name is on the Sick Report.

J. CONFIDENTIAL MATTER

1. Men in this School must realize that a great deal of the information received here is of a strictly confidential nature and is becoming more and more confidential every day. All cadets should be on their guard, at all times, against giving out any information that would be of value. Remember that, altho a thing may seem to you to be very trivial it may be of great value to the enemy, and that your own life and the lives of thousands of other soldiers depends on your ability to keep things secret. Guard your speech and correspondence at all times and never discuss any matters pertaining to the Army with any one.

2. Men discharged from this School are required to turn in all notes that they have taken during the course here and any other material that has been given out to them here.

3. No photographs will be taken in the Drill Hall.

K. MEDICAL DEPARTMENT

1. All men who are not able to do full duty are required to report to the Surgeon at "Sick Call." All cases marked "Sick in Quarters" must report daily at "Sick Call" or as directed.

2. Treatment and dressings will be given daily at "Sick Call." Except in cases of emergency men will not request treatment at any other time.

3. Men reporting to the Medical Office at any hour must be accompanied by the Squadron Sick Report with proper entries made therein.

4. The men entering this school will be vaccinated against the typhoid fevers and smallpox and sent for at the time noted on the schedule. All men who claim credit for vaccination against typhoid fever and smallpox must claim such credit before the time set for such vaccinations. Otherwise these claims will be disregarded.

5. Just before leaving the school, all men will be examined by the Medical Officer for evidence of communicable diseases.

6. Men who expose themselves to infection with venereal disease must report at once on their return to the Post, to the medical dispensary for prophylactic treatment prescribed. Failure to do this renders a man liable to Court Martial, even though no disease follows. In the event that venereal disease is contracted, the attempt, by the surgeon, to prevent the same does not affect the soldier's status; the disease is still, not in the line of duty. (G. O. 45. June 1912.)

7. As from \$10,000 to \$20,000 may be spent by the Government on a cadet before his training is complete, each man should consider it a duty to keep himself in good physical condition at all times and should have no hesitancy in reporting to the Surgeon for treatment.

8. A claim that sickness interfered with a cadet's work will not be considered unless the man's name is on the Sick Report.

L. ABSENCES

1. Except as noted below no passes will be granted for later than 8:00 P.M. except on Saturday and Sunday nights. On these nights passes may be obtained until taps.

2. Men awaiting discharge or transfer may obtain passes from 6 P.M. to 9:15 P.M., but applications for these passes must be made to the Regimental Adjutant before Retreat of the evening for which the pass is desired.

3. On Friday night, passes will be given to the graduating squadron, until 11:00 P.M.

4. After the D-week, cadets whose work is satisfactory, may obtain week-end passes from Saturday noon to Monday at 8 A.M. Applications for these passes must be handed to the Squadron Commander before Friday noon of the week that the pass is desired.

5. Flying cadets returning from pass must turn in their passes to the Regimental Adjutant immediately on reporting back. The passes must be signed and must have the date and hour of return.

6. Between reveille and retreat, all members of this command, at the Post, will stand all roll calls, whether they are on pass, or not.

7. Cadets reporting sick and ordered to Hospital will, before they leave, turn in to the Squadron Supply Sergeant all personal property, either in locker trunk or barrack bag, (overcoat to be placed in barrack bag). All bedding will be turned in to the Q. M. and a receipt given the Squadron Supply Sergeant.

In urgent cases, where men are unable to attend personally to this, the Squadron Supply Sergeant will be notified and take necessary action.

M. MESS

1. There is a commissioned officer in charge of the mess who is known as the Mess Officer. Upon his recommendation a Senior Mess Sergeant is appointed by the Senior Military Instructor. There are, also, four other

mess sergeants and four mess corporals appointed. Each squadron acts as mess detail in its "B" week.

2. No cadet will be allowed to fall out of ranks, while marching to mess, to go off the Post for meals.

N. PHOTOGRAPHS.

1. In accordance with orders from the Office of Director of Military Aeronautics, certain group and individual photographs will be made at prescribed times. Cadets will report promptly at the times and places designated for the taking of these photographs and they will pay, in advance, for the individual pictures.

O. LAUNDRY

1. All laundries in good standing will have equal chances to do business in the school. This also applies to private parties doing laundry work.

2. The University provides a locked enclosure where the returned laundry will be kept.

3. In every case, before laundry is returned, it shall be paid for; in other words the business will be conducted on a strictly cash basis.

4. All laundries or private parties co-operating in this scheme shall provide laundry bags properly labelled. These will be issued to the cadets on a deposit of 20c which will be refunded when the bag is returned. No free bags will be given out.

5. A list of the laundries co-operating will be posted and cadets will not be allowed to ask which laundry to patronize, so that all laundries will have an equal chance.

6. Outgoing laundry will be deposited in the Receiving Room in the basement and the person in charge will see that each laundry gets the bags bearing its name.

7 The room for returned laundry will be open at the following times :

Daily except Saturday and Sunday.

1:00 to 2:00 P.M.

6:00 to 7:30 P.M.

Saturday.

9:00 to 10:00 A.M.

1:00 to 3:00 P.M.

P. POST OFFICE

1. A Branch Post Office is operated at the School by the U. S. Government, with facilities for handling registered letters, money orders, parcel post, insurance and the sale of stamps, envelopes, etc.

2. Separate sets of boxes are placed in the main passage in the Drill Hall for letters, for newspapers and for notices to call at the window for parcel-post packages, registered mail and special delivery letters. The boxes are not to be used as depositories for rubbish.

3. Before leaving the School every Cadet should leave his forwarding address at the Post Office window.

Q. RECEIVING ROOM

1. All incoming and outgoing packages, except parcel post and incoming laundry, are handled from the Receiving Room in the basement.

2. All outgoing laundry which is to be called for, is to be left at the Receiving Room.

3. Notices of receipt of packages are deposited in the boxes next to the Post Office Window. These Notices must be receipted and left at the Receiving Room when packages are called for.

4. All outgoing express packages must be securely packed and must have the sender's name and address on

the outside. The shipper's name and address must also be placed on the inside of the package and a statement of the contents must be given to the Receiving Clerk. All express is sent collect.

R. LOST AND FOUND BUREAU

1. All articles found about the Armory should be turned in at the Lost and Found Bureau, next to the Post Office, where the owners may claim them upon proper identification.

OFFICE HOURS :

Week Days—1:45 to 2:00

7:30 to 7:45 (except Saturday's)

Sundays— 9:00 to 9:15 A.M.

S. TELEGRAMS AND TELEPHONE CALLS

1. Cadets are not permitted to use office telephones for their personal convenience. Use the public phones.

2. **Telephone calls for Cadets will be received only between 1:00 and 2:00 P. M. and between 6:00 and 7:30 P. M. (except Saturday afternoon and Sunday) and then only on the following phones: Bell 867: Ithaca 2090.** Parties calling Cadets must give their numbers; the cadets will then be notified at the earliest opportunity and will use the public phone. If the cadet cannot be found, a notice will be left for him in the box with his mail.

3. Messages for cadets will not be accepted over the telephone except in cases of very great urgency.

4. Telegrams may be received at the School by phone. Telegrams delivered will be placed in the boxes with the mail, if the cadet can not be found. Collect messages will not be received. Telegrams can be sent over public phone and charges dropped in the coin box, or they may be sent collect by phone.

T. LEAVING

1. Before leaving this Post each enlisted man must square his accounts with the Quartermaster and the Supply Officer. See instructions under the headings QUARTERMASTER and SUPPLY OFFICER.

2. All enlisted and discharged men before leaving the Post will obtain from the Registrar a "Registrar's Card" which they will take to: 1. the Clerk of the Academic Board, 2. the Q. M. Supply Sergeant, 3. the Assistant Pay Clerk, 4. their Squadron Supply Sergeant, 5. the Regimental Adjutant, and 6. the Registrar. In each case the officials above mentioned will inform the man as to what will be required of him.

When a graduating squadron is leaving, one man will collect the Registrar's Cards for the squadron and will take them to the Clerk of the Academic Board; afterward the squadron will report in a body, in alphabetical order, to the Supply Sergeant, Assistant Pay Clerk and Regimental Adjutant.

3. Men who are discharged by the Examining Board from further training at this Post will report to the Registrar not later than nine o'clock on the morning following the meeting of the Examining Board.

4. Men discharged from the School must deliver to the Regimental Adjutant all notes that they have taken during the course here, all instructional material issued to them, and two identification badges (name plates) complete.

5. Men transferred to other posts must be examined by the Surgeon for communicable diseases before leaving this School. Upon request, Cadets will be given vaccination certificates by the Surgeon.

6. Graduates and discharged men should leave forwarding addresses at the Post Office window.

7. All bills contracted in the city will be paid before departure.

U. FIRE REGULATIONS.

The following instructions will be observed by this command in case of FIRE or other EMERGENCY.

1. The Officer of the Day will act as Marshal.

2. At "Fire Call" or "Call to Arms" all Squadrons will form in their respective streets and await further instructions.

3. If "Fire Call" be sounded, each Squadron Commander will detail the necessary number of men of his Squadron to procure the fire extinguishers, axes, and fire buckets in the immediate vicinity of his Squadron quarters. These men will then proceed to the scene of the fire, reporting to the Fire Marshal or senior officer present.

4. If the alarm be "Call to Arms," all Squadrons will form in their respective streets, *under arms*, and await instructions.

5. In case of fire or other emergency the Guard will form, *under arms*, and await instructions.

6. In case either of the above-mentioned calls are sounded while classes are in session, instructors will at once dismiss their classes and Squadrons will then be conducted to their respective streets as rapidly as possible and *without confusion*.

7. It is strictly enjoined upon all members of the command that in case of either of the above mentioned calls being sounded, all unnecessary noise be avoided.

V. Y. M. C. A.

The Y. M. C. A. is here to serve the men in every possible way. Entertainments, socials, moving pictures, and religious meetings are frequently arranged. Writing material is supplied to any who want it. A Secretary is in charge who will gladly co-operate in promoting anything that will benefit the men.

W. POST EXCHANGE.

The Post Exchange is operated according to Post Exchange Regulations of the Army, and is for the convenience of the men at this Post. So far as possible the prices are kept considerably below the retail trade prices. The profits are used for squadron benefit and the purchase of such things as athletic equipment and field music instruments. Small sales must be strictly cash, but larger items such as foot lockers and text books may be charged, but must be paid by the soldier on next pay day.





217

Property of*	Location	Total Sheets
--------------	----------	--------------

Signed _____

QUANTITY	MATERIAL	SIZE	REMARKS	STACK ROOM	INV. CARD

M. A.---Cornell

6. M. A.--Cornell

U. S., C. U. (bought for School), Borrowed from

MAKE A CARBON COPY AND KEEP IT.

U. S. A. School of Military Aeronautics

Cornell University, Ithaca, N. Y.

TELEGRAM

(WRITE DISTINCTLY)

To :

From :

Date :

Western Union or Postal

Received by

Time

NOTE:—All messages should be made out in duplicate using carbon paper for second copy. In case of Telegrams addressed to the Commandant or to the School, both copies should be placed in the "IN" basket on top of the Post Adjutant's desk. In case of a telegram addressed to an individual, put the original copy in the Post Adjutant's "IN" basket and then deliver the duplicate copy to the Addressee.

841

U. S. A. SCHOOL OF MILITARY AERONAUTICS, Cornell University, Ithaca, N. Y.

Memorandum for.....

Date.....

253

INTERDEPARTMENT MEMORANDUM

(Send Carbon Copy with the Original. Leave space at bottom of sheet for answer to be added by informant)

FD-110—MANUFACTURED BY AMERICAN SALES BOOK CO., LIMITED, NEWARK, N. J.

RECEIPT FOR
LETTER
FROM
COMMANDANT'S FILE

I have in my possession and
will be responsible for letter number

I will return same to the clerk
in charge of the letter file as soon
as I am through with it.

(Signature)

Date

191

U. S. School of Military Aeronautics
Ithaca, N. Y.

2015

Name

Call at Window for

Package

Registered Letter

Special Letter

Received

U. S. A., S. M. A.—Call for Package Card

7978

WEEKLY ABSENCE REPORT

Name ----- Week ending ----- 1918

The above named employee has missed time as given below :

TIME MISSED		REMARKS :- Reasons, Etc.
DATE	AMOUNT	

These reports are to be sent to the office of President of the Academic Board on each Monday for the preceding week. If no time has been missed in the Dept. the fact is to be reported on one of these slips.

Signed -----

U.S.A., S.M.A.

7617

Head of Dept.

(Last name) -----

(Initials) -----

CHECKING OUT SLIP

Before leaving the employ of this school the following is to be filled out.

1. Have you returned all Government property issued to you?
2. Have you returned all University property issued to you?
3. Have you returned your button?
4. Have you returned your pass?
5. Have all keys been returned to the office of P. A. B. ?
6. Is it required that the Draft Board be notified of your leaving?

(If so, give necessary information).....

7. Your future address is:

8. New position is:

Date of leaving.....

Signature

U.S.S.M.A.

8433

PASS

U. S. ARMY SCHOOL OF MILITARY AERONAUTICS
AT CORNELL UNIVERSITY

No. A Issued

Pass

To the NEW DRILL HALL

This Pass is good only for 19
when signed by the Adjutant, Lt. W. L. Saunders or W. N.
Barnard.

By order of the Commandant,

5149

PASS

U. S. ARMY SCHOOL OF MILITARY AERONAUTICS
AT CORNELL UNIVERSITY

No.

Pass to

{ Gallery only
Mess Hall only
Quarters only
Building

This pass is good only for 1917
when signed by the Adjutant, Lt. W. L. Saunders,
or W. N. Barnard.

By order of the Commandant,

Return this pass to Adjutant immediately after date of expiration.

NOT TRANSFERABLE

5905

U. S. Army School of Military Aeronautics
CORNELL UNIVERSITY
 ITHACA, N. Y.

----- 191 -----

Name ----- Company -----

Requests permission to be absent

from -----

to -----

for the purpose of -----

Address will be -----

Forwarded recommending-- { *Approval*
 Disapproval

 Commanding Company
 Approved:—

 Commanding Detachment

Returned----- 191 --, ----- M.

Signature-----

(Return to Regimental Adjutant)

PASS PERMIT

DELINQUENCY REPORT

Name of Delinquent _____

Date _____

Time _____

Delinquency _____

Reported by _____

Finding _____

Date of Finding _____

Sentence _____

6675 _____

Court Officer _____

Surname	Initials	Sq. Class	Sq. Class	Sq. Class	Sq. Class	Sq. Class	Sq. Class
Unsatisfactory Record in :	To take the following :	Week beginning :				Remarks	



	MON.	TUES.	WED.	TH.	FRI.	SAT.
8						
9						
10						
11						
1:30						
2:30						
3:30						

8669

Name ----- (Surname) (Initials)								Subject -----							
Class of -----								Instructors -----							
Period -----	1	2	3	4	5	6	7	8	9	10	11	12	Final		
Date -----															
Scholarship -----															
Discipline -----															
Attitude -----															
Gen'l Knowledge -----															
*Avg. for Period -----															
Remarks: -----															

*Weekly Report

INSTRUCTOR'S RECORD--U. S. A. SCHOOL OF MILITARY AERONAUTICS AT CORNELL UNIVERSITY

Name ----- (Surname) (Initials)								Class of ----- Engines						No. -----		
Period	1	2	3	4	5	6	7	8	9	10	11	12	13	Weekly Report		
Squadron														Squad.	S	E
Date														C		
Scholarship														D		
Efficiency														E		
Instructor														F		
Period	14	15	16	17	18	19	20	21	22	23	24	25	26	G		
Squadron														H		
Date														I		
Scholarship														K		
Efficiency														L		
Instructor														M		
Remarks :																

ENGINE RECORD---U. S. A. School of Military Aeronautics at Cornell University.

Squadron		Instructor		Group		NAME	Eff.	Abs.	Schol.	REMARKS
Week										
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										

U.S.A., S.M.A.—GUNNERY RECORD IN EFFICIENCY.

797

(Surname) (First name) (Middle name) (Rank)

Address _____ No. _____

Enlisted _____ at _____ by _____ Enl. Period _____

Reported per _____ Date _____

Class graduating _____ Turned back to _____

1. Case disposed of _____ Clerk Acad. Board

2. Amt. due for Q. M. property _____ Asst. to Quartermaster

3. C_R signed; C_R due _____ charged _____ paid _____ Asst. Pay Clerk

4. Case disposed of _____ Regimental Adjutant

5. Records entered _____ Registrar

On leave (graduated, special) _____ 191 _____ Mail Address _____

Transferred to _____

Per S. O. _____ Hq. U. S. A. S. M. A., Ithaca, N. Y. _____ 191 _____

Per _____ Left _____ 191 _____

Discharged per (_____) _____ 191 _____

Trans. furnished, not furnished

To _____

Remarks _____

(OVER)

U. S. A. School of Military Aeronautics at Cornell University, Ithaca, N. Y. 7643 REGISTRAR'S CARD.—3

INSTRUCTIONS. (1) Do all your work on this sheet—use no “scratch” paper for computations, sketches, etc. (2) Cross out work on which you do not wish to be graded. (3) If your work is continued on the back of the sheet, add the word “*Over*” at the bottom of the page. (4) The conciseness and completeness of answers as well as the general appearance of the paper may influence the cadet’s mark in efficiency. (5) Sign the following statement after completing the paper:

I have neither given nor received unauthorized aid in this quiz.
N.B. Papers turned in without signed statement will not be considered.

HONOR SYSTEM

MARK

FINAL EXAMINATION

U. S. ARMY
SCHOOL OF MILITARY AERONAUTICS
CORNELL UNIVERSITY
ITHACA, N. Y.

Student's Name -----
(Surname) (First Name) (Initial)

Date of Examination -----

Subject -----

Squadron ----- Graduation Date -----
(Letter) (No.)

DIRECTIONS TO STUDENTS

1. Sit in alternate seats unless otherwise directed by the officer in charge of the examination.
2. Use this form of examination book, and no other, except in case of special permission.
3. Before beginning the paper, fill out the blanks in the middle of this page.
4. Use no loose sheets for computations, notes or sketches. Do all of your work on pages of this paper and cross out the parts on which you do not wish to be marked.
5. The conciseness and completeness of the answers as well as the general appearance of the paper may have influence in determining the cadet's mark in efficiency.
6. After completing the examination sign the following :—

STATEMENT :—I have neither given nor received unauthorized aid in this examination.

Signed by cadet after completing examination.

N.B.—PAPERS TURNED IN WITHOUT SIGNED STATEMENTS WILL NOT BE CONSIDERED.

ANALYSIS OF FINAL EXAMINATION QUESTIONS

SCHOOL OF MILITARY AERONAUTICS, CORNELL UNIVERSITY, ITHACA, N.Y.

231

SUBJECT-----SQUADRON-----CLASS OF-----WEEK ENDING-----

QUESTION NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	TOTAL
MIS PER QUEST.																		
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		

NO OF FAILURES

Stencil No.35.

ANALYSIS OF EXAMINATION
at
U. S. S. M. A.
at the

(University)

(Place)

Subject.	Instructor
DATE OF EXAMINATION	
SQUADRON	
CLASS OF	
HIGHEST GRADE	
LOWEST GRADE	
AVERAGE GRADE	
90-100 "PASSED WITH HONOR"	
80-90	
70-80	
PASSING GRADE 60,65 to 70	
FAILED	
NUMBER OF MEN	
(Write nothing below double line: for Inspectors only)	

CHARACTER OF EXAMINATION - REMARKS.	

MEN TURNED BACK

2003

WEEK OF _____

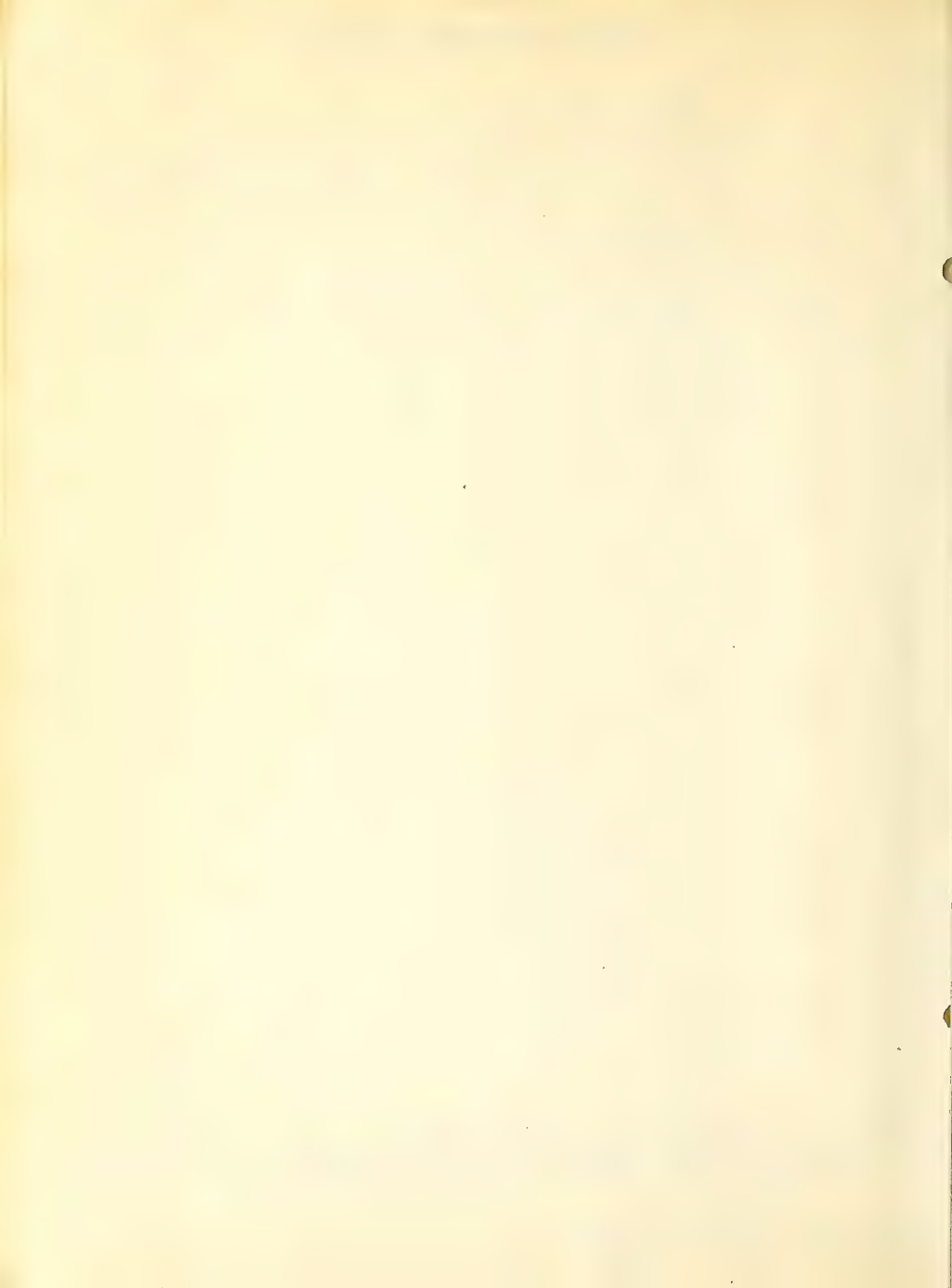
The following men are not advanced to the next squadron

NAME	Squadron	Class of	Unsatisfactory Record in the following	Turned back to take drill and the following work and no other during week given above
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

*Report to the Examining Board in the Commandant's Office at _____
 N.B. NO CHANGES IN THE FOREGOING WILL BE AUTHORIZED UNLESS IN WRITING AND
 SIGNED BY SOME MEMBER OF THE EXAMINING BOARD.

U. S. A. School of Military Aeronautics
 Cornell University, Ithaca, N. Y.

_____ Date



Squadron----- Date----- Subject-----

Class of----- Report for the week or for final examination?-----

Instructor making report----- Total No. in Section-----

NAME	REMARKS*							Scholarship	Conduct	Eff.
1										1
2										2
3										3
4										4
5										5
6										6
7										7
8										8
9										9
10										10
11										11
12										12
13										13
14										14
15										15
16										16
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*Give the remarks on the reverse side of sheet if there is not sufficient room on the front



UNITED STATES ARMY

SCHOOL OF MILITARY AERONAUTICS

AT

235

WEEKLY CLASS REPORT

Squadron.....of Class Graduating.....191.....; Week Ending.....191.....
A, B, C; D, E, F, G, or H

	NAMES <small>(In alphabetical order)</small>	Military Studies	Signalling and Radio	Gunnery	Aids to Flight	Airplanes	Engines	Aerial Observation	Calisthenics	Infantry Drill	Conduct	Efficiency	Passed in all Subjects	Demoted	Discharged	REMARKS
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V G, Very Good=90-100

G, Good=75-89

F, Fair=60-74

Passing Grade=(60)

P, Poor=50-59

M, Thoroughly Unsatisfactory=below 50

Efficiency by.....

Commandant.



UNITED STATES ARMY
SCHOOL OF MILITARY AERONAUTICS
 AT
CORNELL UNIVERSITY, ITHACA, N. Y.

Z 236

No. in Squadron----- **WEEKLY CLASS REPORT**

Squadron-----of Class Graduating----- 191----- ; Week Ending----- 191-----
 A, B, C, D, E, F, G, or H

NAMES (In alphabetical order)	Military Studies	Signalling and Radio	Gunnery	Aids to Flight	Airplanes	Engines	Aerial Observation	Art. Obs.	Infantry Drill	Conduct	Efficiency		REMARKS
											Report	Report	
1													
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Passing Grade=60

P, Poor=50-59

M, Thoroughly Unsatisfactory=below 50

Efficiency ..

Commandant.

TO BE FILLED OUT BY CADET—USE INK—WRITE OR PRINT CLEARLY

PRINT

FILL IN		Status	
(Surname)		(Middle name)	(Date of Birth)
(First name)		(Age)	
(Street address)		(City)	(State)
Birthplace		Height (stripped)	Weight (stripped)

Father or stepfather: (a) Name _____ Surname _____ First Name _____ Middle Name _____

(b) Birthplace _____

(c) If naturalized give date and particulars _____

High or Prep. School(s) you attended _____ From _____ to _____ Course in _____ Graduate? _____

College (s) you attended _____ From _____ to _____ Course in _____ Graduate? _____

Was your standing in scholarship excellent, good, fair or bad? _____ Degrees (with dates) _____

(a) Athletic activities; (b) On what teams; (c) Positions played: _____

State (a) Education, (b) Training and (c) Amount of experience in each of the following fields:

(1) Military: _____

(2) Engineering (kind, extent, etc.) _____

(3) Business (kind, extent, etc.) _____

(4) Aviation (kind, extent, etc.) _____

(5) Telegraphy or radio _____

(6) Any other items showing special fitness for flying _____

843

OVER

OVERSE

Theoretical and practical knowledge of gasoline engines, motor car, boats, &c.

Have you been dismissed from employment because of misconduct or inability? (State circumstances) :-

Occupation before reporting

Occupations last 4 years

Give name and address of local draft board (fill in, even if not subject to draft)

At what city (or camp) did a board of officers examine you mentally for admission to this school?

Date of arrival at this school

Signed

U. S. S. M. A.

PERSONAL RECORDS.

ABSENCE RECORD

On Pass

Remarks:

Hospital

Quarters

844

REVERSE



CONVENTIONAL SIGNS

In Most General Use On

MILITARY MAPS

RAILROADS

American

Single Track

Double Track

Electric

Single Track

Double Track

Electric

R.R. in Cut

R.R. in Fill

R.R. in Tunnel

2 Railroads

R.R. Station

HIGHWAYS

Metalled Surface

Improved Surface

Unimproved but cut out

Trail or path

Steep Incline

FENCES

General

Barbed Wire

Smooth Wire

Worm

Stone

Board

Hedge (usually in green)

Telegraph Line

Alex's road-small scale Maps

Electric Power

Transmission line

Windmill

WATER FEATURES

RESERVED IN BLUE WHEN POSSIBLE

Ditch

Canal

Canal Locks

Stream under 15 wide

Fordable Stream

Large Stream

Intermittent Streams

Springs

Lake

Dry Lake

Tidal Flats (salt pond)

Arroyo (stream in blue)

Levee (stream in blue)

Falls

Rapids

Dam (in black)

Sand Dunes (in brown)

Windmill

WATER CROSSINGS

FORDS

Infantry & Cavalry

Cavalry only

Wagon & Artillery

FERRIES

Boat

Rope or Trail

Steam

BRIDGES

Truss (w/ Steel w/ Wood)

Foot

Draw

Suspension

Arch

Pontoon

Aqueduct

General (small stream)

TREES

Deciduous

Coniferous

Forest

Scattered

Woods of heavy undergrowth

Orchard

LAND

Grass-Meadow Land

Fresh Marsh

Salt Marsh

Vineyard

Corn

Cotton

Ploughed Land

Cemetery

BUILDINGS

Houses

Barns

Outhouses

Church

Hospital

Post Office

Telegraph Office

Factory (show kind)

Electric Power Plant

City, Town or Village












City, Town or Village generalized

HEADQUARTERS

STAFF CORPS

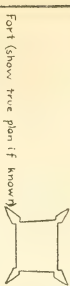
Engineer.

Infantry in line.....

Infantry in column.....	
Cavalry (as above).....	
Mounted Infantry (as above).....	
Artillery.....	
Wagon Train.....	
Sentry.....	
Platoon.....	
Inf. Platoon.....	
Cav. Platoon.....	
Inf. Support.....	
Cav. Support.....	

Camp.....▲▲▲▲▲

Trench



Redoubt (true plan if known)...

Gun Battery.....

Mortar Battery.....


Battle-----X

Good Ldg Place for Airplanes.-

Possible Ldg Place.....✓✓

OBSTACLES
EXECUTED IN RED WHERE
POSSIBLE

Abattis-----y y y y

Chevaux de frise.....

Palisades	
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Wire Entanglement-----

Demolitions..... 64

Contact Mines-----

Controlled Mines -----

Mine Crater.....❖

Mine Crater Fortified.....②

AUTHORIZED ABBREVIATIONS

A.	Arroyo	Mt	Mountain
about	Abutment	Mts.	Mountains
Ar	Arch		

	mi.	Not Fordable
b. Brick		
B.S. Blacksmith Shop		

	Branch	Pk.	Plank
	Bridge	P.O.	Post Office

C. Cape Cemetery and Queen Post

cov.	Covered	R.	River
cr	Creek	at	Drowned Houses

[illegible]

D.O.	Drug Store	S.H.	Schoolhouse
			Steel

Est.	Estuary	Sta.	Station
		st.	Stone

Fort
Tollate

Trusa
tr
Girder
Q.M.
Sic

Island	W.T.	Water Tank
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Jc.	Junction	W.	West
		w.	Wood

Fake L.

Ldg. Landing
s life saving
states

Long
Longitude



U
A28
.537
A3

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History of the United States Army School